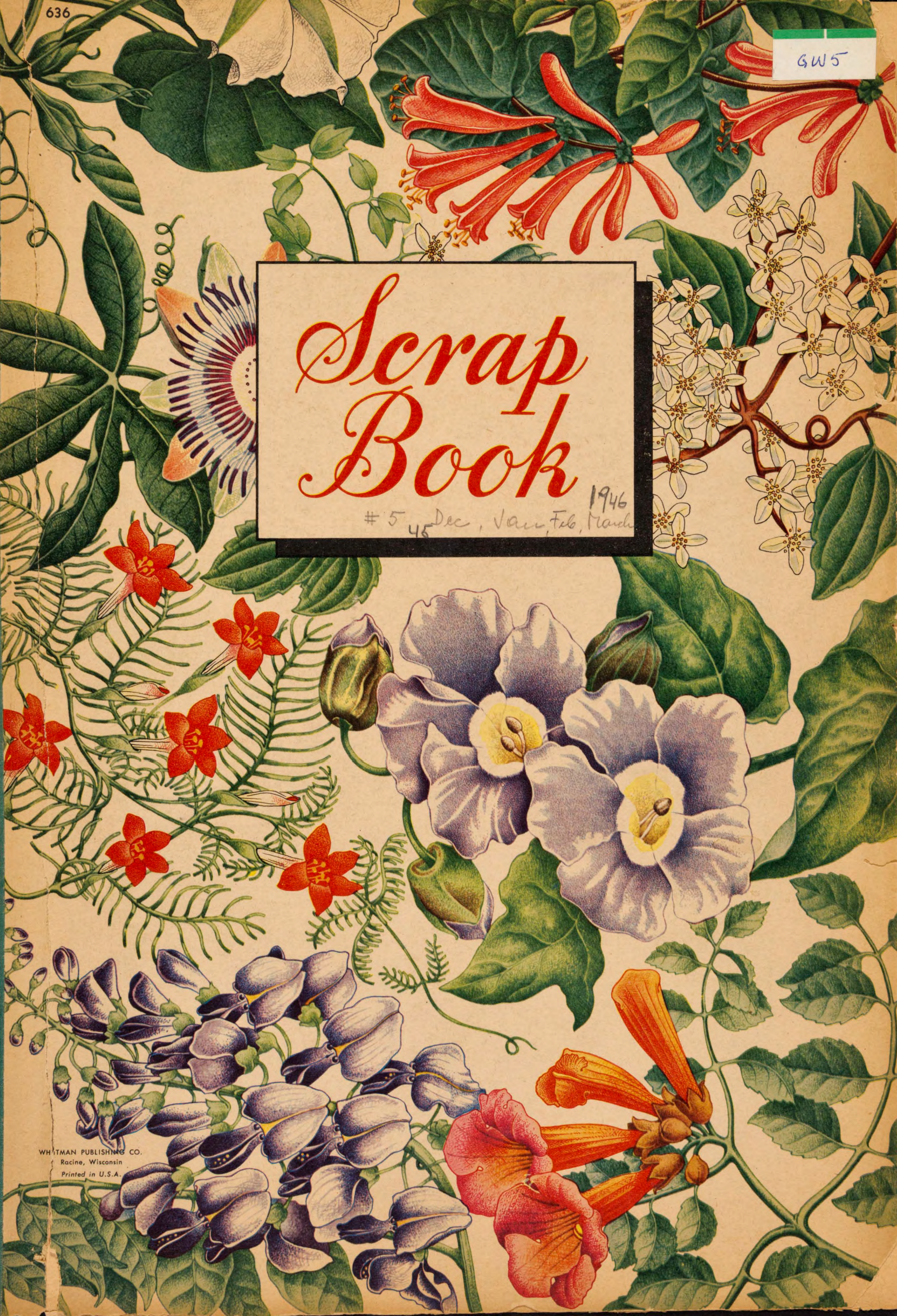


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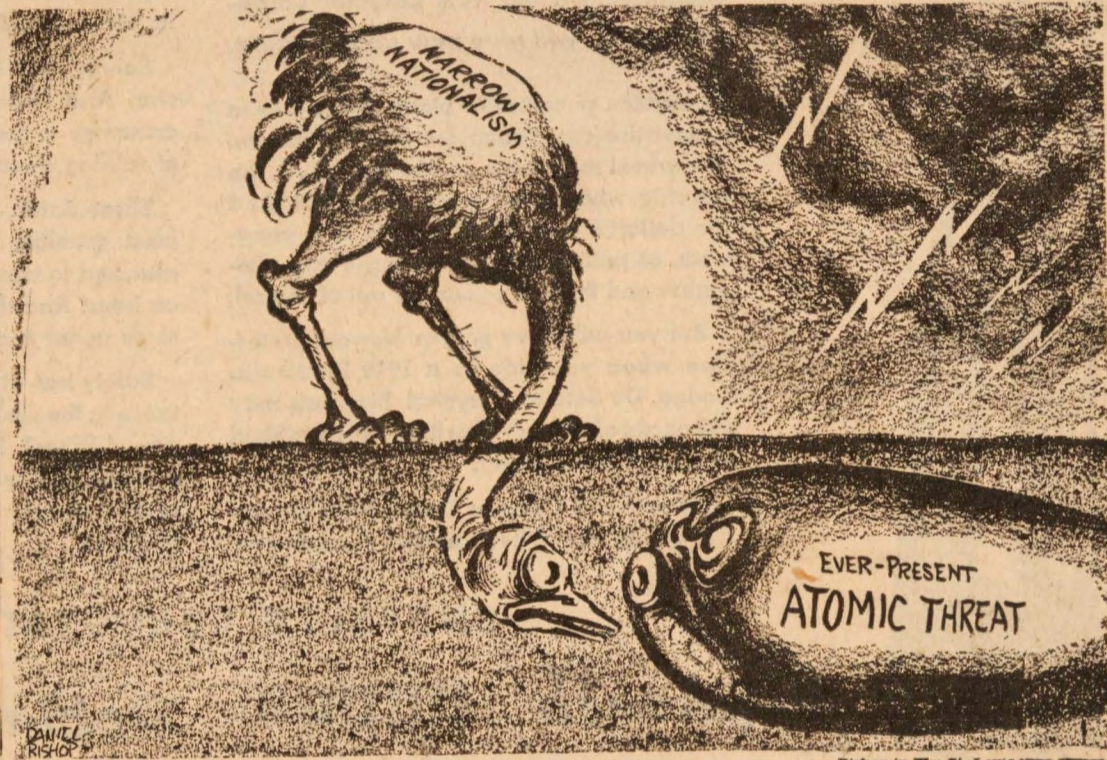
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ARMY, NAVY SHAPE BOMB TEST AT SEA

Official Plan Is Announced
—Industrial Revolution Is
Predicted by Scientist

NYT 12/11
By ANTHONY LEVIERO

SPECIAL TO THE NEW YORK TIMES.
WASHINGTON, Dec. 10—The War and Navy Departments formally announced this evening that they would make a joint test of atomic bombs against warships and that preparation had begun for the experiments, which may determine the fate of sea power in the atomic era.

The brief statement did not set a date for the historic event when the disintegrating force of the splitting invisible atom will be hurled against the massive armor of modern capital ships. Rather, it stressed the difficulties that must be overcome before a new view of atomic power was presented to the world. The statement follows:

"The Army and Navy contemplate joint tests of atomic bombs against naval vessels, Secretaries Patterson and Forrestal announced today. Planning is already under way, which will involve large problems of logistics, including the assembly of many naval vessels, extensive instrumentation for measuring results, and assembly of necessary personnel."

Industrial Revolution Seen

The announcement of the test came several hours after the Senate's special committee, formed to work out a national atomic energy policy, had heard a witness say that atomic energy might bring on an industrial revolution in about twelve years, that Russia would hold the best cards in an atomic armament race, and that a narrow, bureaucratic security policy had delayed production of the atomic bomb by eighteen months and thus prevented its use against Germany. The proposed naval test has been the subject of considerable

discussion in the capital in recent weeks, and this has brought out many factors involved in such a test that the short announcement did not touch on. The Army Air Forces, for instance, have been working aggressively to get a leading role in the experiment to make sure it would not be an all-Navy affair. Under the aegis of the War Department, and as the only agency that could operate for the Army in the circumstances, it is assumed that the Air Forces will get their wish.

The need for secrecy on the results will have to be weighed against the suggestion of Senator Brien McMahon, chairman of the Senate's Special Atomic Energy Committee, that an international audience should be permitted to witness the test. His view is that the world's statesmen must be impressed with the horror of the weapon and, further, that it would be a gesture of good-will leading toward international control of atomic energy.

Overhead and underwater explosions under the ships will undoubtedly be employed. Dr. J. R. Oppenheimer, former director of the Los Alamos atomic bomb laboratory, is authority for the statement that the bombs will do greater damage under water. He has also testified that the cost of atomic bombs, compared with that of battleships, is so small as to raise doubts as to the value of capital ships.

Proposals that the tests be made on captured Japanese and German vessels have been countered with demands that at least some obsolescent American warships be subjected to the ordeal.

Weights U. S. Against Russia

Dr. Leo Szilard of the University of Chicago, first of the physicists in this country to sense that an atomic bomb was possible, frankly weighed the United States against Russia before the Senate committee and concluded that this country would be at a disadvantage in an atomic arms race. He estimated it would take us ten years at a cost of \$20,000,000,000 a year to relocate and decentralize our industries and population, while the U.S.S.R. would need only two or three years.

The scientist delivered many astonishing and challenging facts in his Hungarian-accented voice. For instance, he attributed the eighteen-month delay to the compartmentation of scientists, so that they could not put "2 and 2" together and progress by deduction and induction. He further asserted that a more enlightened policy had enabled British scientists to give us important information in 1941, and that but for them we might not have had an atomic bomb.

The weight of Dr. Szilard's atomic facts finally induced Senator McMahon to advise a hard-scrubbing Army captain to get a transcript of the record and turn it over to his superior, Maj. Gen. Leslie R. Groves, director of the atomic bomb project. Senator McMahon suggested that the general might wish to make a rebuttal. It was also decided that several problems raised by Dr. Szilard might be safely discussed only in executive session.

An industrial revolution for the United States loomed up when Dr. Szilard said that twenty tons of plutonium, most easily produced and plentiful of fissionable mate-

rial, could produce in one year as much power as the whole of the United States was capable of producing in a year before the war. Because the cost and feasibility of such power production were a challenge to coal and electricity, Dr. Szilard declined to say more openly.

"I wouldn't talk about it if I didn't think it would be cheaper than coal ten years from now," Dr. Szilard remarked.

Links Atom and Economy

The scientist outlined a method of "geometrical progression" by which a reserve of fissionable material now used in atomic bombs might be accumulated for industrial purposes. He added:

"If the output of fissionable substances will increase in a geometrical progression (to provide twenty tons a year), as I have assumed it will, atomic power will not be an important factor in our power economy for perhaps ten years. Then, rather suddenly—that is, within a few years—it might become a very important factor affecting our economy and monetary policy.

"We might then make use of the building of atomic power installations for stabilizing our system of economy. In times when a depression threatens, electrification of our railways, based on atomic power plants may be pushed with the support of the Federal Government, whereas in boom periods an expansion of atomic energy power projects might be discouraged by the Federal Government."

Discussing means of international control, Dr. Szilard thought atomic energy might be produced in an "internationalized" area of the world where fissionable material would be produced, and if all stayed well in the world, the stuff could be distributed to various countries for power purposes.

Reading a question submitted by a reporter, Senator McMahon asked whether violation of the treaty governing the area might

DENVER ATOM PARLEY FOR BOLSTERING UNO

NYT 12/11
Special to THE NEW YORK TIMES.
DENVER, Col., Dec. 10—The United Nations Organization must be greatly strengthened and large numbers of scientists should be exchanged with other nations, a conference on atomic energy recommended today in a statement sent to Secretary of State James F. Byrnes.

Foremost scientists, including four key figures in the development of the atomic bomb, and educators took part in the sessions. Among them were Dr. Arthur H. Compton of Washington University, St. Louis Nobel Prize winner and chief physicist in atomic bomb research; Dr. Lyle Borst of Oak Ridge, Tenn.; Dr. Samuel K. Allison of Los Alamos, N. M., and Dr. Joyce C. Stearns of Washington University.

The principal conclusions of the conference were:

Other nations will be able to develop the atomic bomb in three to five years, regardless of the United States secrecy. The only defense against the bomb is avoidance of war.

Only an effective international organization can control use of the atomic bomb by preventing war.

Government control of research on atomic power would be an invasion of fundamental democratic freedoms.

In a general report the conference warned against legislation that would empower the Government to censor publication of basic scientific material or to "direct conduct of scientific research."

Participants urged immediate action toward setting up the international commission for the control of atomic energy proposed by President Truman, Prime Minister Atlee of Britain and Prime Minister W. L. Mackenzie King of Canada.

CURBS ARE ASSAILED ON ENEMY SCIENCE

NYT 12/11
Roundly condemning attempts to curb scientific research in Germany and Japan because of fear that it would be misused, Dr. Alan Valentine, president of the University of Rochester, pointed out yesterday that the German dye industry, which introduced mustard gas, also introduced sulfanilimide. "We must not hamper the pursuit of scientific truth by the apron strings of fear," he warned.

Speaking at presentation ceremonies in the Hotel Waldorf-Astoria for the seventh annual scientific award of the American Pharmaceutical Manufacturers Association in honor of the Rockefeller Institute for Medical Research, Dr. Valentine said the world cannot be divided into victorious people who pursue truth freely and conquered people who do not. "If it is logical to destroy cyclotrons in Japan, then it is logical to destroy all enemy libraries and close all enemy schools," he asserted.

Emphasizing that war had robbed science of much valuable research, Dr. Valentine said leading war scientists were the first to admit that they have been using up the capital of fundamental research done before the war.

In accepting the award of the pharmaceutical manufacturers, Dr. Herbert S. Gasser, director of Rockefeller Institute for Medical Research, in an address read by Dr. Homer Swift, noted that there has been "a growing appreciation of the long-range view in scientific research."

not bring on the greatest Armageddon in history by nations contending to gain control of it. Dr. Szilard conceded he had not thought the plan out thoroughly but that the area might be situated where it could be bombed and destroyed if a war developed.

On secrecy, Dr. Szilard said compartmentalization was "the cause for our failure to realize that light uranium might be produced in quantities sufficient to make atomic bombs."

Praises British Freedom

"We should have known that in the fall of 1940," he said, "we might have failed to realize this altogether, just as the Germans failed to realize it, if we hadn't had the good fortune that the British scientists were not compartmentalized. They were able to put 2 and 2 together and communicated their conclusions to the United States Government in the middle of 1941. Had we, in the United States, reached these conclusions in the fall of 1940 we most likely would have had bombs ready before the invasion of Europe."

Dr. Szilard said the "British" scientists were Drs. Frisch, Peierls and Simon, whom he had persuaded to get out of Hitler's Germany for their own good. They got one step ahead of him in 1941, he said, toward "the specific goal" of the atomic bomb. He also charged that the security regulations prevented American scientists from discuss-

ing plutonium production techniques with their Canadian colleagues, who thereupon developed a process superior and more efficient than the American.

If "preparedness" was necessary in the atomic age, said Dr. Szilard, it was "because we consider Russia a potential enemy," but Senator McMahon interjected:

"We consider Russia a friend." "If we want preparedness we've got to know what we're preparing for," replied the witness.

In his prepared statement, however, Dr. Szilard's references to Russia were more in the nature of hypotheses, and he suggested that control of atomic energy could be assured by an exchange of scientists by the two nations. Americans would "vacation" for four weeks in Russia, and Russian physicists would do the same here, to determine that military use was not being made of atomic power.

Dr. Szilard did not view with equanimity, he said, the death of possibly 40,000,000 Americans in an atomic war, as suggested by a previous witness. He recalled that Dr. Vannevar Bush, another physicist, had said it sounded like a Buck Rogers or Jules Verne story. He added:

"Maybe this is a Jules Verne story. But by the same token you might call the story of Hiroshima an H. G. Wells story. Wells, as a matter of fact, wrote a story about atomic bombs and their use in 1914 ['The World Set Free.']."

'UNNECESSARY ARMY SECRECY DELAYED BOMB 18 MONTHS'

Post 12-10-45
Washington, Dec. 10 (AP)—A scientist testified today that unnecessary military secrecy had delayed production of the atomic bomb at least 18 months.

Dr. Leo Szilard, Chicago University physicist, told the special Senate Committee that Army officers asked the scientists to work only on parts of the project and not discuss results with other scientists on other parts. He added this was "unnecessary."

Sen. Johnson (D-Colo.) asked "how much delay this caused in production for use of the first atomic bomb?"

Szilard said that the bomb could have been produced "about the spring of 1944 according to my best guess."

Prof. Einstein Indicts World's Leaders

No Time Left For 'Petty Bargaining,' He Warns

PH 12/11

Speaking in the name of the physicists who gave the atom bomb to the American and British people as "trustees of the whole of mankind, as fighters for peace and liberty," Prof. Albert Einstein drew up last night a passionate indictment against the governments of the great powers who have failed to guarantee this peace and liberty and to fulfill the promises of the Four Freedoms.

"We feel it our duty," Einstein said, "to speak up and to remind those responsible that there is no escape into easy comforts, there is no distance ahead for proceeding little by little and delaying the necessary changes into an indefinite future, there is no time left for petty bargaining."

Einstein spoke by transcription to the Fifth Annual Nobel Anniversary Dinner at the Hotel Astor. Following is the full text of the speech:

"The Nobel anniversary celebration takes on a special significance this year, when, after a deadly struggle of many years, we are at peace again—or what we are supposed to consider as peace. And it bears a still more specific significance for the physicists who, in one way or another, were connected with the construction, or the use, of the atomic bomb. For these physicists find themselves in a position not unlike that of Alfred Nobel himself. Alfred Nobel invented the most powerful explosive ever known up to his time, a means of destruction par excellence. In order to atone for this, in order to relieve his human conscience, he instituted his awards for the promotion of peace and for achievements of peace.

Warns of Disaster

"Today, the physicists who participated in forging the most formidable and dangerous weapon of all times are harassed by an equal feeling of responsibility, not to say guilt. And we cannot desist from warning and warning again, we cannot and should not slacken in our efforts to make the nations of the world, and especially their governments, aware of the unspeakable disaster they are certain to provoke unless they change their attitude toward each other and toward the task of shaping the future.

"We helped in creating this new weapon in order to prevent the enemies of mankind from achieving it ahead of us, which, given the mentality of the Nazis, would have meant inconceivable destruction and the enslavement of the rest of the world. We delivered this weapon into the hands of the American and the British people as trustees of the whole of mankind, as fighters for peace and liberty. But so far we fail to see any guarantee of peace, we do not see any guarantee of the freedoms that were promised to the nations in the Atlantic Charter.

"The war is won, but the peace is not. The great powers, united in fighting, are now divided over the

peace settlements. The world was promised freedom from fear, but in fact fear has increased tremendously since the termination of the war. The world was promised freedom from want, but large parts of the world are faced with starvation while others are living in abundance. The nations were promised liberation and justice. But we have witnessed, and are witnessing even now, the sad spectacle of "liberating" armies firing into populations who want their independence and social equality, and supporting in those countries, by force of arms, such parties and personalities as appear to be most suited to serve vested interests. Territorial questions and arguments of power, obsolete though they are, still prevail over the essential demands of common welfare and justice.

"Allow me to be more specific about just one case, which is but a symptom of the general situation: the case of my own people, the Jewish people.

Forsaken People

"As long as Nazi violence was unleashed only, or mainly, against the Jews the rest of the world looked on passively, and even treaties and agreements were made with the patently criminal government of the Third Reich.

"Later, when Hitler was on the point of taking over Romania and Hungary, at the time when Maidanek and Oswiecim were in Allied hands, and the methods of the gas chambers were well known all over the world all attempts to rescue the Romanian and Hungarian Jews came to naught because the doors of Palestine were closed to Jewish immigrants, and no country could be found that would admit those forsaken people. They were left to perish like their brothers and sisters in the occupied countries.

"We shall never forget the heroic efforts of the small countries, of the Scandinavian, the Dutch, the Swiss nations, and of individuals in the occupied parts of Europe who did all in their power to protect Jewish lives. We do not forget the humane attitude of the Soviet Union who was the only one among the big powers to open her doors to hundreds of thousands of Jews when the Nazi armies were advancing in Poland.

Misery Again

"But after all that has happened, and was not prevented from happening, how is it today? While in Europe territories are being distributed without any qualms about the wishes of the people concerned, the remainders of European Jewry, one fifth of its pre-war population, are again denied access to their haven in Palestine and left to hunger and cold and persisting hostility. There is no country, even today, that would be willing or able to offer them a place where they could live in peace and security. And the fact that many of them are still kept in the degrading conditions of concentration camps by the Allies gives sufficient evidence of the shameful and hopeless situation.

"These people are forbidden to enter Palestine with reference to the principle of democracy, but actually the Western powers, in up-

holding the ban of the White Paper, are yielding to the threats and the external pressure of five vast and underpopulated Arab States. It is sheer irony when the British Foreign Minister tells the poor lot of European Jews they should remain in Europe because their genius is needed there, and, on the other hand, advises them not to try to get at the head of the queue lest they might incur new hatred and persecution. Well, I am afraid, they cannot help it; with their six million dead they have been pushed at the head of the queue, of the queue of Nazi victims, much against their will.

"The picture of our postwar world is not bright. As far as we, the physicists, are concerned, we are no politicians and it has never been our wish to meddle in politics. But we know a few things that the politicians do not know. And we feel the duty to speak up and to remind those responsible that there is no escape into easy comforts, there is no distance ahead for proceeding little by little and delaying the necessary changes into an indefinite future, there is no time left for petty bargaining.

"The situation calls for a courageous effort, for a radical change in our whole attitude, in the entire political concept. May the spirit that prompted Alfred Nobel to create his great institution, the spirit of trust and confidence, of generosity and brotherhood among men, prevail in the minds of those upon whose decisions our destiny rests. Otherwise human civilization will be doomed."

Warning

Other speakers were Sen. F. W. Fulbright (D., Ark.), Sir Norman Angel, Harry M. Warner and Pearl Buck.

Warning that the people of Asia are developing a hatred of us because of our policy of intervention, Pearl Buck said: "What we need and must have is an act as bold and unexpected for good as the atomic bomb was for evil. Some single act which will . . . restore the faith of Asia's people in democracy. Let us declare ourselves for the freedom of all peoples from foreign rule now. . . . Then let us commit ourselves to make that freedom practical."

HT Science and Security 12/11

There are two things which are striking about the report on the medical aspects of the atomic-bomb project which has been released, with the approval of Major General Leslie R. Groves, by the University of Rochester, where most of the medical work was done. The first is the brilliance of the vistas which have been opened up, in the fields both of research and treatment, by the new knowledge of nuclear fission. The second is the fact that the report had to be approved and censored by General Groves. "Much that was learned," as the Herald Tribune's account puts it, "about the effects of radiation on health and on heredity can be mentioned but not specified. How much radiation will kill a human? The scientists know, and can say they know, but cannot tell the answer."

Here is the plain consequence of our confused and obscurantist policy of mixing science with military security. The work on the atomic bomb produced an immense creative by-product of knowledge. Its greatest immediate promise appears to lie in the new weapons it has provided for the attack on cancer; but beyond that there are vast possibilities in the study of all chemical and biological processes. The layman has no means of guessing to what constructive uses the masses of technical data now assembled in the files of the Manhattan Project might be put, but they are certainly great. In the past, data of this kind would immediately have been given to the scientific world. They would have been fed as a fructifying stream into the existing mass of international scientific knowledge, to be used and enriched by minds all over the world and returned for the greater benefit of all. It was in this way that the basic knowledge which made possible the atomic bomb was accumulated; it is only in this way that

the constructive potentialities of our knowledge of nuclear fission can be developed. But security steps in.

It must do so as long as we persist in the self-defeating policy of regarding our triumphs in the new science as a military secret. As long as our best answer to the great problems and great responsibilities of nuclear fission is the military one of sitting on the "secrets" and trying to make more and bigger atomic bombs faster than any one else can do, we will be stifling the creative development of scientific knowledge while insuring only that our own science will recoil upon us in the end with a maximum of destructiveness. As Secretary Byrnes sets out for Moscow to talk, among other things, about the atomic bomb, one hopes that he will carry with him a larger grasp of this subject, in all its aspects, than is embraced by the military attitude.

Atom Bombing Of 'Task Force' Expected Soon

Army and Navy Call Plans for Test Well Advanced; Cite Huge Fleet Required

By Samuel W. Bell 12/11

WASHINGTON, Dec. 10.—Plans for testing atomic bombs upon naval ships are well advanced in the War and Navy Departments, Secretaries Robert L. Patterson and James V. Forrestal announced in a joint statement issued here today.

The language of the statement left little doubt that the forthcoming tests of the most devastating weapon ever devised will not be confined to its effect on a single vessel, but to surface craft aggregating task-force strength.

Secretary Patterson and Secretary Forrestal stated the operational planning now under way involves "large problems of logistics," naming these as the most outstanding: (1) the assembly of "many naval vessels"; (2) the fabrication of instruments for measuring the scientific results of the explosions, and (3) the assembly of the necessary personnel.

Although the joint announcement was not specific beyond these points, it was assumed that the tests will be made in some remote area of the Pacific because of lack

of knowledge of the effects of an atomic bomb explosion over water.

One of the predicted results will be a massive tidal wave which could only be absorbed in an area of ocean where the disturbance would not spend itself against inhabited coasts or in normally traveled shipping or air lanes.

There has been considerable speculation that the tests might be conducted in the vicinity of the Marshall or Caroline Islands in the South Pacific after the evacuation of the few Japanese who may remain on the outlying islets of those groups.

Even in such sparsely inhabited areas, it was pointed out in authoritative quarters here today, it would be necessary to establish a land, sea and air quarantine belt of huge proportions, involving large-scale preliminary planning.

The joint Army and Navy announcement did not mention a test of submarine atomic explosions, but it was assumed that this, too, is contemplated, described by Secretaries Patterson and Forrestal in the following guarded text:

"Planning is already under way for the operation which will involve large problems of logistics, including the assembly of many naval vessels, extensive instrumentation for measuring results and assembly of necessary personnel."

In the course of recent hearings before the special Senate committee on atomic energy, Dr. Vannevar Bush, Director of the Office of Scientific Research and Development, and Dr. Irving Langmuir, assistant director of research for General Electric Company, urged that naval tests of the bomb be conducted before the military and naval representatives of the United Nations.

Although officials of the War, Navy and State Departments would not comment on this today, no denial was offered to the suggestion that the projected tests would be one of the subjects under discussion at the forthcoming Moscow meeting of James F. Byrnes, Secretary of State; British Foreign Minister Ernest Bevin and Soviet Foreign Commissar V. M. Molotov.

Aside from the demonstrated effect of atomic explosives upon surface and subsurface craft, the test may well be, in effect, a pitting of land-based air power against surface naval strength, since it is possible that the Army's B-29 Superfortress, which conveyed the atom bombs to Hiroshima and Nagasaki, will be the instrument of delivery in the naval test. Appearing today before the Sen-

ate committee on the atom bomb, Dr. Leo T. Szilard, of the University of Chicago, told the committee that the "unnecessary" veil of "military secrecy" thrown about the development by the War Department probably delayed the development of the weapon for eighteen months or more.

The witness said the scientists on the project had a "self-imposed secrecy policy when the Army took over the work in 1942," but the Army "compartmentalized" the data and permitted scientists to know only a small part of what

was being done. Had there been freer exchange of information, he said, the scientists could have made more rapid progress.

Senator Edwin C. Johnson, Democrat, of Colorado, asked "how much delay" was caused by compartmentalization.

"Very great delay," Dr. Szilard replied.

"When could the first bomb have been dropped had there been no compartmentalization?" Senator Johnson asked.

"In the spring of '44—eighteen

months earlier," Dr. Szilard answered.

Other committee members, however, defended the Army's security plan, pointing out that the work was done with such complete secrecy that Germany was "amazed" to learn of the atomic bomb "even in the summer of 1945."

Army Role in Sea Test Of A-Bomb Seems Won

PM AAF Planes Likely To Help Navy in Trial Against War Vessels

Washington Bureau 12/11

WASHINGTON, Dec. 11.—The Army Air Forces are believed to have succeeded in their demand for a share in the forthcoming test of atomic bombs' effectiveness against naval vessels. The fact that the impending test was announced jointly last night by the War and Navy Depts. indicates that the experiment no longer is contemplated as a purely Navy project with the concomitant danger that the Navy, jealous of its tradition, might pull its punches in dropping the bombs.

The expectation now is that the bombs will be released from Army planes, possibly from a huge new super-bomber with a range of 3000 miles.

It probably will be months before the test can be made, because it will be necessary to assemble target ships in desired formations, arrange for the stationing of observation vessels, and prepare delivery of the bombs themselves.

Captured Japanese vessels as well as obsolescent U. S. ships probably will serve as targets. The Japanese Navy has only one surviving battleship, the Nagato. It has six carriers and five cruisers. The War Dept. declined to say whether enemy ships would be used, but it is known that our armed forces are particularly anxious to use some of our own ships, to determine their vulnerability to the atom.

As to the size of the bomb, here's the latest tip: Dr. Leo T. Szilard,

atomic scientist, said: "One man couldn't carry a bomb—but six men or a truck could." One of the bitterest critics of the Army's secrecy on the project, he made the statement before the Senate Atomic Energy Committee. So secret have the size, shape and weight of the bomb been kept that guesses have ranged all the way from five to 400 pounds.

Neither the Army nor Navy would elaborate on the experiment announcement by Secretaries Robert Patterson and James V. Forrestal, which said simply:

"Planning is already under way for the operation, which will involve large problems of logistics, including assembly of many naval vessels, extensive instrumentation for measuring results, and assembly of necessary personnel."

The test is expected to determine once and for all the usefulness of a big fleet of capital ships in atomic war—a point of controversy even among top atomic scientists—and have strong bearing on the type of Navy this Nation will maintain in peace time, especially as to the usefulness of battleships. It also may affect Congress's decision on the proposed Army-Navy merger, which the Navy opposes.

In his Senate appearance Dr. Szilard ridiculed those who believe peace can be made secure because of nation's fear of retaliation in an atomic war, even though the U. S. A. and Russia "both have large bomb stockpiles." He said "such a situation would inevitably lead to war," and "the first step is to rule out the manufacture of atomic bombs."

ATOM STUDY SET UP BY CARNEGIE GROUP

Peace Endowment Creates a Research Committee—Tribute Paid to Dr. Butler

NYT 12/11

The setting up of a committee of inquiry and research on atomic energy by the Carnegie Endowment for International Peace was announced yesterday after the semi-annual trustees' meeting at the Carnegie Corporation, 522 Fifth Avenue.

The trustees also paid a tribute to Dr. Nicholas Murray Butler, who was elected president emeritus, after his resignation as president of the Endowment.

The thirty-five members of the research committee are persons prominent either in the field of atomic research or community leaders. Among the scientists were Karl Compton and Harold Urey. John Foster Dulles, Senator J. William Fulbright of Arkansas, David Sarnoff and Harold E. Stassen also were on the list.

"We express our deep appreciation to President Butler and gratitude for his invaluable services rendered constantly and gratuitously over a period of thirty-five years," the tribute to Dr. Butler said. "We congratulate him that his years have lengthened to enable him to witness the collaboration of the United States Government in the formation and establishment of the United Nations Organization."

"The Charter of the United Nations, with the annexed Statute of the International Court of Justice, was approved by the United States Senate by an overwhelming majority. The Charter and this enabling act are a realization of the plan Dr. Butler advocated thirty-five years ago, to establish an international police force to maintain peace. We express our heartfelt wish that he will live to witness the successful operation of the UNO, which in its primary purpose and structure corresponds precisely with the views of Mr. Carnegie himself."

The Endowment received yesterday a letter from James F. Byrnes, Secretary of State, expressing gratitude for a recent meeting it sponsored in Washington on "America's Commitments for Peace," which was attended by many important national organizations working in the international field.

We'll Test A-Bomb On Naval Vessels

Washington, D. C., Dec. 10 (U.P.).—The Army and the Navy revealed tonight that planning is under way for the experiment which may hold the fate of the battleship—a test of the atom bomb's effect against naval vessels.

The announcement, made by Secretary of War Patterson and Secretary of the Navy Forrestal, said: "Planning is already under way for the operation which will involve large problems of logistics, including the assembly of many naval vessels, extensive instrumentation for measuring results and assembly of necessary personnel."

The atom tests have been projected since the first bombs were dropped on Hiroshima and Nagasaki. They are expected to decide whether atomic power minimizes the importance of a fleet. The Navy contends it does not. It also may affect Congress' decision on the proposed Army-Navy merger, which the Navy opposes.

Will Use U. S. Ships Also.

Captured Jap vessels, as well as obsolescent U. S. ships probably will be used as targets. U. S. vessels are expected to be the main target, because the armed forces want to learn how our ships will stand up. The Navy probably will designate several battleships and carriers, as well as lighter ships. Army planes may drop the bombs.

It is expected that two tests will be conducted. One would measure the bomb's effect when exploded in the air above ships. The other would record what happens to assembled vessels when a bomb is used as a depth charge.

It probably will be months before the test can be arranged. President Truman, in disclosing

recently that A-bombs are still being made for experimental purposes, apparently was referring to the naval test.

Meanwhile, the Senate atomic energy committee was told by Dr. Leo. T. Szilard, Chicago atom bomb scientist, that the first A-Bomb could have been dropped in the Spring of 1944 if the secrecy imposed by the Army had not, according to the witness, delayed its development.

Secretary of State Byrnes announced Oct. 31 that a four-power agreement had been reached for destruction of remnants of the Jap fleet by the U. S., presumably in atom bomb tests.

The agreement, among the U. S., Britain, Russia and China, called for destruction of one battleship, four aircraft carriers, four cruisers and 51 submarines.

Italian and German ships may also be included in the tests.

Submarine Navy With Atom Fuel And Surface Speed Held Safest

Dr. Alvin M. Weinberg Tells Senate Group the Warships of the Future May Travel 1,000 Feet Below Sea Level

By ANTHONY LEVIERO

Special to THE NEW YORK TIMES.

WASHINGTON, Dec. 12—The Navy of the future, powered by atomic fuel, will travel 1,000 feet under water as fast as today's surface vessels, a 30-year-old physicist told the Senate Committee on Atomic Energy today. By way of emphasizing the need for international amity in the atomic era, he said the ocean depths would provide the only safe refuge in an atomic war.

The witness was Dr. Alvin M. Weinberg, chief of the theoretical physics section of Clinton Laboratories in the Oak Ridge, Tenn., atomic bomb plant. He stressed the peaceful applications of nuclear force, while Dr. Clarke Williams of City College, New York, another atomic bomb maker, offered a plan of inspection that might be used by an international atomic energy control agency.

A plea for international control based on treaties and good faith was expressed by Dr. John A. Simpson, who began making atomic bombs four years ago at the age of 25. A member of the Nuclear Studies Institute of the University of Chicago, he is at present working in the metallurgical laboratory plutonium project. All three scientists appeared as representatives of the Federation of Atomic Scientists.

Atomic Fire Without Oxygen

"The atomic fire at Hanford [atomic bomb plant in the State of Washington] burns without oxygen," Dr. Weinberg said. "Here is an ideal fuel for use in a submarine; with it a ship can travel as fast under water as on the surface. The navy of the future, if there is such, will consist of submarines which will travel a thousand feet below the ocean. The safest place on this tortured planet, should an atomic war break out, will be deep below the surface of the ocean."

Dr. Weinberg also said that one pound of fissionable material released as much energy as several million pounds of ordinary fuel and, because of its portability, would be economical in regions like the Arctic. He declared that space travel now deemed fantastic would have to be considered seriously, but that security regulations must be relaxed to permit the rocket experts and the atomic power experts to get together.

Referring to the "compartmentalization" that has prevented physicists in one section of the atomic bomb project from exchanging professional information with those in other sections, Dr. Williams charged that this kind of isolation was so complete that no one person was qualified to consider the feasibility of inspecting atomic plants in conjunction with a control scheme. He believed that an effective system was possible, however, and he urged that an effort to create such a system should

be hastened as it would be more difficult to find plants after they were built.

Dr. Williams said the feasibility of inspection depended on the possibility of making a complete check of all scientific and technical personnel in every country to insure that no important number were being secretly trained and diverted to large-scale atomic bomb plants. He believed that there would always be scientists and technical men in any country who would be willing to report violations to an international control commission.

In opening the hearing, Mr. Simpson said he expressed the common opinion of the overwhelming majority of scientists and engineers who worked on the bomb project and who felt that the United States must take the lead in reshaping international affairs to obtain world security before other countries developed atomic bombs.

The three physicists, who know all about the chain reaction that produces the atomic explosion, were heavily belabored all day by the chain questions of Senators who sought to draw out their views on the political aspects of control. The questions came in sections, spun out at great length and linked by such words as "suppose" and "assume" until some hypothetical but terrible war situation was built up. The questions usually concluded with the phrase, "What would you do?" Sometimes the witnesses said they did not know. Senator Tydings asked the following question substantially in these words:

"Suppose control was worked out, plants were licensed in six countries and were in operation for the three years, and assume an inspector goes to Country B and finds everything okay, and suppose immediately after the inspector leaves its fissionable material is used to make atomic bombs within six months; two things might happen: (1) there would be a surprise attack and neither the victim nor the United Nations Organization could do anything because they would have no atomic bombs; or, (2) the offending nation would be discovered and would use the bombs as a threat to gain some advantage.

The answers were many and varied and the committee invariably picked them apart. An answer by Dr. Weinberg was that another was impossible to conceive in the atomic era, for if the war did not begin with atomic bombs it would surely end with them.

Senator Tydings summed up his views by saying, "What we're getting at is not merely outlawry of atomic bombs but of war."

Atom Committee Named By Carnegie Endowment

Trustees Also Elect Dr. Butler
HT President Emeritus 12/11

A thirty-seven-man committee of inquiry and research on atomic energy was appointed yesterday by the trustees of the Carnegie Endowment for International Peace. At their semi-annual meeting in the offices of the Carnegie Corporation, 522 Fifth Avenue, the trustees also elected Dr. Nicholas Murray Butler as president emeritus, following his resignation as president. The meeting marked the thirty-fifth anniversary of the founding of the endowment.

Among those named as members of the atomic-energy committee are Dr. James P. Conant, president of Harvard University; John Foster Dulles, attorney; George Fielding Elliot, military writer for the New York Herald Tribune; Raymond D. Fosdick, president of the Rockefeller Foundation; Senator J. William Ful-

bright, of Arkansas; David Sarnoff, president of the Radio Corporation of America; Harold E. Stassen, former Governor of Minnesota; Harold Urey, professor of chemistry, University of Chicago; Henry D. Smyth, of Princeton University, author of the Smyth report on atomic energy, and Thomas J. Watson, president of the International Business Machines Corporation.

George A. Finch, secretary of the endowment, read at the meeting a resolution praising Dr. Butler's services as president. The trustees announced that they would elect a new president at a meeting next year.

NYP 11/13

An atomic bomb raid against the United States would be a catastrophe, but a point to keep in mind is that any conceivable defense system will also be a catastrophe for American life. Most of the defenses would be nearly as bad as the danger. Dr. Leo Szilard, of the University of Chicago, testifies that it would take ten years, at a cost of \$20,000,000,000 a year, to relocate and decentralize our industries and population, so that no overnight raid could destroy us. While we would save some of our lives thereby, we would lose our cities just as surely as if they had been bombed. The difference is that we would atomize our cities ourselves, and the culture that goes with them, before the enemy could do it; but in either case they would be gone.

Not the Same Country

The trouble with the reasoning of those who tell us to "keep the bomb secret" and to defend ourselves, is that we seem obliged to lose the American scheme of life, or to alter it profoundly, under every conceivable plan for defending it. By the time the defenses are complete, the thing which is being defended no longer exists in recognizable form.

Even a more or less primitive defense scheme, without relocating cities, would probably involve halting every incoming ship several hundred miles out, and giving it an atomic go-over; but then every incoming airplane, according to current speculations, would have to be halted, too, maybe on floating artificial islands, while government inspectors (none of whom I see as being very quick about it) looked around. In addition, we would need fleets of things carrying radar and stuff, and perhaps cruising space-ships, loaded down with wonderful scientific equipment, none of which you can buy for a nickel.

In the end, far from doing our work peacefully, behind our defensive screen, we would find ourselves working to maintain and support and develop that screen, as all of America became one gigantic atom-bomb repelling apparatus.

They Don't Leave Much Behind

The costs of atomic defense cannot even be calculated in the same terms as those used for normal military outlays. For example, the possibility has been publicly raised of detonating approaching atomic rockets by concentrating electrical beams upon them. The Association of Los Alamos Scientists says maybe it could be done, but that mental arithmetic is almost enough to show it would take all the electrical power now produced in the United States, and maybe even more, to work the necessary gadgets and utensils. The trouble with most of the "defense" plans is that they leave mighty slim pickings behind; and, in philosophical and economic terms, the difference between losing all our electrical power resources to enemy action, and tying them all up through fear of enemy action, is slight.

One Field in Which We Can't Win

It is hard to visualize a defense scheme against the atomic bomb that will not, in itself, be a dreadful blow at America; an economic and social calamity, even if successful. The issue is not whether we shall go forward to peacetime uses of atomic energy, or reserve the ugly thing for war; the issue is far sharper, and it is whether we are going to be able to keep our present level of civilization, or be forced backward into a de-centralized, de-culturalized and de-pocketbookized existence.

And suddenly it is quite clear, and not at all paradoxical, that international control of atomic energy alone can save the American way of life. For this is one field in which we cannot win; or, if we do, it will be at such cost that a battalion of accountants will not be able to tell the victory from a defeat.

MacArthur Stands Firm on Cyclotron Issue

Insists Patterson's Office Gave 'Specific' Orders to Destroy Instruments

By Wireless to the Herald Tribune
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TOKYO, Dec. 13.—Destruction of five Japanese cyclotrons used for atomic research was carried out on "specific instructions" received Nov. 9 from the office of Secretary of War Robert P. Patterson, a spokesman for General Douglas MacArthur insisted today.

He denied "any inferences that might be made that the decision to destroy the Japanese cyclotrons had been made by occupational forces."

This latest development in the controversy resulted from an Associated Press dispatch from Washington, dated Dec. 11, which said that the War Department apparently had asked MacArthur headquarters for a report on the matter. An earlier Herald Tribune story reported that Patterson ordered the destruction, but he denied this.

MacArthur's spokesman said today that the instructions from Patterson's office directed precisely that the cyclotrons "at the Institute for Physical and Chemical

Research, the Imperial University of Kyoto and the Imperial University of Osaka, be destroyed" after obtaining all technical and experimental data.

It is recalled that General

George C. Marshall, as outgoing chief of staff, ordered only seizure of the cyclotrons and that General Dwight D. Eisenhower, as new chief of staff, wanted at least the largest one saved.

ATOM POWER HELD BOON FOR THE NAVY

Dr. Ross Gunn Says Energy Is Being Studied—Bomb Test Was Suggested by Truman

WASHINGTON, Dec. 13 (UP)—Atomic power would be of great value for submarines and would "greatly extend" their underwater operations, Dr. Ross Gunn of the Naval Research Laboratory said today.

He hinted that the Navy was studying the development of giant cargo submarines driven by atomic power. He told the Senate Atomic Energy Committee, however, that he did not want to discuss this subject at a public hearing.

Dr. Gunn said that the Navy had been working on nuclear power sources for ships since 1939 and that "the main job of nuclear energy is to turn the world's wheels and run its ships." He said that atomic energy could prolong civilization beyond the span of other known energy sources. Its discovery "means a long civilization, for at the rate we have been going there will not be any energy left in 500 years, especially oil," he said.

He defended the military policy of super-secrecy during the development of the atomic bomb. Some scientists contend that "compartmentalization" of atomic data delayed the atom bomb by eighteen months. But Dr. Gunn argued that German scientists had "a free hand," but got nowhere with atomic bombs.

Truman Suggested Bomb Test

WASHINGTON, Dec. 13 (AP)—President Truman proposed the projected Army-Navy test of atomic bombs against warships, the White House disclosed today. The War and Navy departments on Monday announced plans for the experiments.

White House Press Secretary Charles G. Ross said at a news conference that Mr. Truman not only approved the decision, but suggested it. "It was his proposal," Mr. Ross said.

Mr. Ross could not say whether the test would be made against American ships or captured enemy vessels.

The Army-Navy statement said plans for the bombing were being made, but set no date for the test.

A reporter asked if Mr. Truman was likely to view the test. Mr. Ross replied that he had no idea, that that matter had not been discussed at all.

Atomic Heat Held Practical

Special to THE NEW YORK TIMES.

ROCK ISLAND, Ill., Dec. 13—The state of development of atomic energy is such that it already is a practical source of heat energy, but there are sound factors to be considered before one can decide whether it will be an important

practical source of energy for any given purpose, declared Dr. Glen T. Seaborg, co-discoverer of plutonium and a leading chemist in atomic bomb research. He addressed chemists and technical men of Illinois and Iowa here tonight. His appearance was sponsored by the American Chemical Society.

Dr. Seaborg declared there were a number of special purposes for which atomic energy could and would be used. He asserted the chief limitation to the use of atomic energy was the large size of the units which, he declared, must have a sufficient amount of shielding to absorb the radiation. He went on to tell of the types of power plants where atomic energy would be useful, describing them as large stationary power plants in which the energy was removed by water or air, seagoing vessels and the propulsion of large airplanes.

"These considerations," declared Dr. Seaborg, "lead to the conclusion that atomic energy best can be used where a high concentration of energy is needed and, at least in the beginning, atomic energy use will not result in an economic saving compared to other sources of energy, such as coal and gasoline."

Fallacies of the Incredible Debate

In the Atombomb Argument, Political Realities Are Taboo

New Leader

By William S. Schlamm

12/15

● William S. Schlamm was for a long time a weekly columnist of *The New Leader*. He is the author of "Dictatorship of the Lie," a book exposing Communist tactics and principles, and "The Second War for Independence" written before the last war. At present Schlamm is member of the editorial board of *Fortune* magazine.

THE extraordinary debate on the atombomb froze, rather speedily, into four brittle fallacies.

Fallacy No. 1: "There is no secret; therefore we must release it at once."

Fallacy No. 2: "The atombomb is the most dangerous toy man could have ever put his fingers on; therefore it should be made available to everybody."

Fallacy No. 3: "World Government of unified purpose and pure intent is the only salvation; therefore the purpose and intent of the participants of such a World Government ought to be completely discarded."

Fallacy No. 4: "An altogether new age began on August 6, 1945, an unknown world is upon us for which we are utterly unprepared; therefore we ought to know immediately what to do, and act without delay."

This listener's digest may be vehemently resented by the debaters, but students of logic (except those who partake in the current flurry of saving the atom-shaken world) will arrive at about the same analytical abstract of the Incredible Debate.

But in support of the main fallacies, two arguments have been presented that wear a thin make-up of sanity:

1—"Though the fundamentals and methods of fission are no secret, a few tricks of manufacturing, assembling and detonating the bomb are at this moment known only to us and the British. If we preserved this operating monopoly (which we might feasibly do for, say, three years), we would scare Russia into a fatal armament race and, besides, stifle free research in our own country."

2—"If we exchanged our time-limited monopoly for an international control of fission activities, cumulative knowledge of what everybody is doing would protect peace better than the preservation of short-lived manufacturing secrets."

Neither argument, it seems to me, has been thought through to the end. Underneath the make-up lie two more fallacies.

It is untrue that armament races result in war. Every war in modern times started when, and because, the expansive party thought the opponent inadequately armed. The longest periods of peace in modern times were those during which the armament of "status quo" powers remained clearly and overwhelmingly superior to any combination of "dynamic" upstarts.

The Incredible Debate resurrected another ghost believed laid, namely the old saw of "if you pile up enough arms, they go off by themselves." Of course, they never did. War must be willed, at least by one side. There was not a single war in modern times that has not been planned and artfully timed by the challenging party.

Specifically, a pre-atomic intelligence like mine fails to comprehend just how the alleged fear of American armament superiority could push Russia into gambling on a war which she would not consider in the case of armament equality, let alone Russian armament superiority. If Russia does not want war (and I think she is at least as much interested in twenty years of peace as we are), she would be imbecilic to accept war because our armament is clearly superior. On the other hand, if there is the slightest possibility that Russia wants war, Russian armament equality, let alone superiority, must increase rather than reduce the temptation. (All this, mind you, is just logical reasoning. For fortune telling I am almost as inadequately equipped as a nuclear physicist.)

Clearly, the didactic objective of the political courses now given in American nuclear laboratories is to teach how to prevent the use of the atombomb (rather than how to make it generally available.) We might forgive our scientists that they were unable to articulate their objective in logically tenable language. But how about this objective? One would assume, again on purely logical grounds, that their problem falls into the category of restriction, not expansion, of destructive skill. Instead of teaching why and

how we ought to share this latest blessing of man's curiosity, the scientists ought to be discussing how to protect man against himself.

This, I understand, they are indeed discussing—when nobody is eavesdropping. Monsignor Sheen is licking his chops, one keeps hearing. Now I have no objection to confessionals in nuclear laboratories (certainly much less objection than to political lectures), but are such shaken souls, just on the threshold of conversion, in the proper condition to guide the rest of us?

Scientists Suffer From Institutionitis

IN regard to human affairs there are few people I wouldn't rather consult than a nuclear physicist. A bartender, for a humble example, is at home with pleas-

ant drunks, brooding crackpots, unhappy husbands, and silly women; so he knows something about the normal conditions of man. The nuclear physicist has learned, alas, how to split the atom, but not much more. If Dr. Oppenheimer is a wise man (which, for all I know, he might be), his humanly applicable wisdom would have nothing, but nothing, to do with his training for physical research. By the same token, if Charles A. Lindbergh had a profound knowledge of foreign affairs (which, for all I know, he did not), it would have nothing to do with the fact that he flew the Atlantic.

It just so happens that I grew up with a number of physicists. There was the normal percentage of amiable and intelligent fellows among them. If there was one common trait among them that distinguished these young men as a group, it was a disarming simple-mindedness in all matters outside their chosen field. It seems that the same personality structure that pushes a man into scientific inquiry makes him a sucker for social panaceas. Nor is this so strange. The scientifically oriented personality would be fanatically resolved to find solutions. Such a personality is innately incapable of ever admitting the existence of an insoluble problem. A

born scientist is patient in all details of scientific experiment, but profoundly impatient philosophically. The genuine physicist will see human inter-relations as a problem in structural arrangements. His prejudice in favor of the experiment will make him more likely than, say, a psychiatrist, to advocate the possibility and advisability of willful interference. God made him an arranger. If he is anything else, besides, he is it by chance—certainly not due to his professional training.

The notion that physicists as physicists should advise us on how to run our human (i. e., political) business is nothing but a reversal of a vulgar prejudice of yesterday. Yesterday's vulgar prejudice: all professors are frauds. Today's vulgar reversal: all professors are wise. The truth: some professors are frauds, some professors are wise—and not because

they are professors, but because they are frauds or wise. The current fad of turning to nuclear physicists for political, human and moral advice is just as repulsive as yesterday's use of the term "professor" for slander.

The nuclear physicist is a predestined victim of the modern malady which I propose to call "Institutionitis." Institutionitis gives the human mind a strange twist to make it believe that the creation or the re-shuffling of formal institutions solves a problem. In relatively innocent cases it results in the setting up of alphabetical agencies. Advanced cases embark upon saving the whole world by International Conferences, World Agencies, and Secretariats.

Our nuclear physicists have caught a pretty bad case of the malady. For example: A recent meeting of theirs voted down a resolution which demanded giving the "secret" to Russia; and then voted unanimously in favor of giving it, immediately, to the Big Five. Now a graduate physicist should be capable of discovering, logically, that he had just voted for the very same resolution he had voted down only five minutes before: With due apologies to Chiang and De Gaulle, the Big Five are of course nothing but the Anglo-American possessors

of the "secret," plus Russia. It may be desirable to let Russia in, but surely it is no less desirable that physicists remember how to handle their own elementary tool, namely logic.

The trouble is, of course, that the physicist, a genuine sucker for easy social "solutions," has no sales resistance: give him an institutional scheme, and he buys it unseen.

Our grandchildren (if the nuclear physicists let us have any) will be astonished to learn that Mr. Norman Cousins, the able diarist of an amusing literary trade magazine, became a combination Thomas Aquinas and Pascal in the intellectual cosmos of our contemporary scientists. They will also read, but refuse to believe, that the Great Einstein took up writing hectic blurbs for a book by E. Reves, an excellent literary agent.

An Elite of Nuclear Physicists?

SO I propose another Manhattan Project. Let us draft the remaining sane minds to develop methods of protecting society against the magic spell of nuclear physicists. The objective: to make clear that Plato's Republic, tyrannically ruled by sage men, would be bad enough, but that its worst possible variation would be a Republic ruled by practitioners of natural science.

But we might want to turn to nuclear physicists for *technical* advice. Maybe they have some intelligent ideas as to how to control the production, and restrict the use, of atomic energy. So what happens? So they don't know a thing—at least not in social terms. Just as the proverbial generals are always preparing for the last war, our nuclear physicists keep on controlling the Hiroshima bomb. But it is our great misfortune that nuclear physics march on. No physicist would deny, in all honesty, that—maybe in months, maybe in a few years—the processes of fission will have changed substantially, if they haven't changed already; technology invariably moves towards vast simplification. In a few months, perhaps in a few years, atoms will be split in plants which compare, in size, to the macabre installment of Oak Ridge as the turtle compares to the dinosaur. Now, while it is at least theoretically conceivable that a few outlandish monsters of plants can be listed and continually investigated all around the globe, it is not even theoretically conceivable that hundreds of thousands of plants, each of them capable of turning the trick, could be effectively controlled.

Though they never faced this problem squarely, our debaters at least betrayed some awareness of it by proposing that all that is needed, anyhow, is a free and regular intercourse of all nuclear physicists on earth. They cannot keep secrets from each other, we are assured; they lay themselves open simply by talking shop; and thus, if the world community of nuclear physicists were kept intact, every nation would know what every other nation was doing to the atom. Could be, could be. But a government irresponsible enough to stake international and individual survival on the chattiness of nuclear physicists ought to be run out of town. Nor would I want to pay taxes to a government which falls for the dead-pan suggestion that the nuclear physicists all around the world should take the Hippocratic Oath.

The Hippocratic Oath? My eye! As to the Hippocratic Oath proper, see Dr. Fishbein, one of the minor saints of the medical profession; he could tell you a thing or two. See also the nuclear physicists themselves who have just let loose in disciplined compliance with the orders of their national government.

Rumor has it that every national government tries to promote, or enforce, allegiance to its objectives. Even nuclear scientists, for reasons of idealism, plus a fixed salary, will not only do anything their government tells them to do but

keep completely mum about what they are doing. If the "secret" could be kept from fellow physicists in the neighborhood of Walter Winchell, it certainly can be kept from fellow physicists in a monolithic country that is so extraordinarily skillful in creating fanatic allegiance to its creed as well as a healthy respect for its concentration camps. So there goes the Hippocratic Oath.

* * *

Is International Control Feasible?

CONTROL of technological activities abroad is feasible only in one of three ways: (A) you can take over the government of a nation as we are doing in Germany and Japan; (B) you can get complete control of all sources of irreplaceable supplies required for certain processes; (C) you can rely on an effective political system of checks and balances, of inquiry and discord, within the individual nation. (Footnote to Point C: One *Chicago Tribune* tells Russia ten times more about us than any number of American spies in Russia could ever tell the USA.) Possibilities A and B are clearly out in the case of Russia. Possibility C—well, how about possibility C?

Now at last we have arrived at the core of the matter. Of course, the schemers will always insist that "the" cause of war is armaments, or monopolies, or what not; and that therefore the way of abolishing war is to arrive at a solemn, institutionalized agreement on whatever is your favorite cause of war. Yet minds of more than two dimensions understand that not this or that particular factor, but the sum total of traits within one or several national organisms produces war. This rather elementary remark has direct bearing on "control." If we had not known it before, history between 1918 and 1945 should have taught us that, by and large, pluralistic societies dislike war and totalitarian societies tend toward it. Why? Simply because pluralistic societies respond faster and more reliably to the many contradictory impulses of man.

If antitheses like "nationalist-internationalist" or "pacifist-militarist" check and fight and suspect each other in the open, they somehow cancel each other out. The only effective armament control I know of (particularly because I know the ludicrous history of "international" control of German armament between 1919 and 1929) is the open quarrel among co-nationals. A Congressman who can get up and shout that the President is a warmonger, is a more reliable guarantee of a non-belligerent American policy than all international control commissions combined. If a monolithic government *intends* to prepare for war, the smartest set of international control agents would be pathetically incapable of digging up evidence so palpable and frightening that the controlling nations couldn't help but let go that preventive atombomb. If a monolithic government does *not* intend war, then international control might be effective; but then it is also superfluous. Except victims of Institutionitis everybody will agree that mutual confidence *in re* armament is not a technical but a political category.

Consequently, there is a danger in establishing institutionalized international control when there is a serious reason for political suspicion. Assuming (just assuming) that Russia *wanted* to prepare for an aggressive atomic war—could she ask for any more helpful screen than an international control arrangement that is ineffective in performance? If international control is not entirely reliable, its existence favors the potential aggressor over his potential victim; simply because world public opinion would assume that everything is taken care of anyhow. If an intelligent pacifist had to choose between ineffective atomic control and an armament race, he should unhesitatingly recommend the armament race—simply because superior armament of the potential victim of aggression is by far the more promising safeguard of peace.

These pertinent matters the nuclear physicists haven't even begun to discuss. And why should they? As nuclear physi-

cists they do not know more (and probably know less) about all this than the conductor of the Detroit Symphony Orchestra or your barber.

* * *

No Fast Solution Now

AT this point, I guess, I am expected to outline my own brand of salvation. Well, I decline. Being one of those underprivileged minds who could not find a definitive solution after all of fifteen weeks of the New Age, I am, in fact, scared stiff of everybody else's hurry. As far as I can see, neither Russia, nor we, nor anybody else, intends to drop an atomic bomb now or at any foreseeable time. The longer we retain a clear handicap, the more time we would have assured for us *and* the Russians to think matters over, to get acquainted with the Atomic Age, to look around, to see all the angles. The philosophy of "now or never" is usually the philosophy of the imbecile. The future has still some future, excitement is no program, and the nuclear physicist by no means the *dernier cri* of the human race. Tomorrow even he will be wiser—and there is a tomorrow.

If this be smugness, I'd rather be smug. Of course, it is the opposite of smugness, because it does not assume the feasibility of "definitive solutions," and because it gives man a break. The trouble with scientists is, in general, that they are conditioned by the atmosphere of the laboratory where experiments can be repeated. In human society, *alas*, experiments cannot be repeated. If you establish, willfully, certain new conditions, they are usually irreversible: you knew one percent of the truth, but you affected reality by 100 percent.

And we would affect reality very much indeed, if we let ourselves be shocked, by a miserable brainchild of ours, into any fast arrangement. The greatest menace of the atomic bomb is that it may blow to pieces our brains rather than the world. The physicists who begot this bastard are trying to charge us with their own troubled consciences. As to war, the atombomb makes it less rather than

more likely. But what *could* happen is that we might get sufficiently worried about our "power" to cede it to someone else; we seem to have gotten a Trojan Horse by its tail.

Though with less reason than the nuclear physicist I, too, am ashamed of our use of the atombomb. But the statesmanship required *post facto* could not possibly consist of an assinine invitation to the world to go ahead and do likewise. Maybe we ought to give Russia "the secret," if it serves any, even a limited, bargaining purpose. This is not the point. The outrageous point is that a few single-tracked minds assure all and sundry we would, in such a way, establish peace; even more, that we would have measured up to the challenge of the Atomic Age. (By the way, has a nuclear physicist so much as raised the question why civil wars under a World

Government should be more pleasant or less destructive than old-fashioned wars between nations? But surely nobody will deny that civil wars under a World Government are at least as feasible as civil wars within sovereign nations—provide the clash of interests and beliefs gets hot enough to result in civil war.)

Nor should anything said here be misinterpreted as an approval of the May-Johnson Bill. This slovenly improvised piece of legislation seems indeed to be full of holes. But, again, this is not the point. The real menace of the day is the emergence of the worst of all possible pressure groups—the high-powered pressure group of presumptuous magicians, their totem masks painted in the colors of omniscience, scaring the wits out of busy men, worried Women's Clubs and an eternally pressure-happy Congress. *Oppenheimer ante portas!*

The Atom-Bomb Controversy: Procedure on Control Debated

Conflict Over Methods Complicates International and Domestic Phases; Science Is Fearful Rigid Secrecy May Drive Research From U. S.

HT By Stephen White 12/16

In the field of facts about the atomic bomb the scientists of this country by their concerted and unparalleled entry upon the public forum, have disposed of most of the more common misconceptions. The American people in general have been convinced that the bomb is indeed a terrible weapon, that it is a weapon against which no specific defense is likely, and that it is a weapon America cannot hope to retain for its own use.

But establishment of agreement on these points serves to underline the conflict of opinion on methods by which this mighty new force can be made to serve man, rather than to destroy him.

Two Difficult Questions

Specifically, this country, as trustee of atomic power, is faced with two difficult questions. First, how is atomic power to be controlled within the country? Second, how is an international approach to the control of atomic energy to be devised and made efficient enough to allay fears of an atomic war?

Domestically, there is no important disagreement concerning the necessity for some form of rigid governmental control. There is a world of conflict, some of it bitter, concerning the lines that such control should follow.

There is, therefore, a good possibility that forthcoming legislation will please both sides. It will place nuclear energy under firm governmental control. It will provide for a licensing system under which private and institutional enterprise may work on problems of nuclear fission. It will control fissionable elements. It will contain rigorous security regulations, designed to retain for this country the engineering know-how.

Research Freedom Asked

But at the same time it will—if the scientists win their way—permit full and unrestricted scientific work on the fundamental problems of nuclear fission, including freedom of publication and freedom of communication among scientists.

The international phase of the problem offers, at the moment, no such pleasing prospect. The general intent of all proposals is to render this country safe from atomic bombings. The method of achieving this end is in dispute.

It could be done, it is generally agreed, by utilizing America's present position of overwhelming power to conquer the world. The proposal has never been seriously put forth by any reputable person and probably never will be.

A second proposal, put forth by the Administration in conjunction with Great Britain and Canada,

would put control of the atomic bomb under the United Nations. Within the United Nations Organization would be a commission holding the privilege of checking on manufacture of atomic bombs and presumably of preventing such manufacture. Basically, it depends on the willingness of the great powers to forswear the use of atomic bombs.

In opposition to the May-Johnson bill may be found the great mass of American scientists, both in and out of the project. Their complaint, reduced to its fundamentals, is that the backers of the bill confuse control of science with control of atomic energy.

Many of them believe that the best interests of this country would be served by concealing nothing about the atomic bomb, but this belief does not enter into their opposition to the May-Johnson bill. For the purposes of domestic control, pending some superseding international agreement, they do not object to rigorous secrecy in such matters as the engineering techniques devised in this country and, to date, the property of this country.

Science Not Private Property

But scientific advances—the basic knowledge of nature—are the property of mankind, and cannot be retained by any country or group, they assert. To attempt such secrecy would be merely to drive science from this country into more friendly surroundings. They point to the interdependence of all science, and offer good evidence that secrecy in any phase of pure science means, ultimately, the death of all science.

Both sides have presented their cases well. After its initial error of attempting to force legislation through Congress without permitting a measured evaluation of its program, the Administration has settled down to the routine of presenting its evidence. The scientists, too, have won popular and legislative support for their point of view. A special Senate committee, under Senator Brien McMahon, Democrat, of Connecticut, is hearing both sides with a great sense of the importance of the subject.

The much-discussed May-Johnson bill serves as a starting point for consideration of the problem. This bill, backed by the War Department and by the Administration, provides for a nine-man commission, directed by a full-time administrator, and in their hands places "plenary control" over atomic energy. It embodies tre-

mendous grants of powers to the commission, and stringent security regulations designed to make all knowledge connected with atomic fission a government preserve.

Supporters of the bill—and they include a good many eminent scientists—offer sound arguments to buttress their position. Control, they say, is necessary, because of the amplitude of the problems, the danger of uncontrolled experiment in the field of atomic fission, and the economic dangers of uncontrolled venturing into this all-embracing field.

Such control, they continue, must by its very nature be wide and sweeping. The science is young: the form that developments may take is far beyond the power of any legislative body to predict. Limited powers could not be written into a bill, since no man can set the limits.

And finally, they conclude, such control must be put into effect as promptly as possible. During this period of uncertainty, the gains we have made at the cost of \$2,000,000,000 are slowly vanishing. Personnel, unable to work under present conditions of insecurity, are drifting to other work. Medical benefits are being held up because the Manhattan District, justifiably thinking of itself as executor rather than administrator of the project, refuses to make decisions until Congress has pointed the way.

Finally, the most radical proposal seeks to scrap the U. N. O. and contrive a world government, in which national sovereignties, so jealously guarded in the U. N. O., would be lost or whittled away. This proposal is far more highly regarded by the scientists and their partisans than by the political and diplomatic bodies who would be called upon to form such an organization.

Fewer Bludgeon Advocates

Those who advocate that this country enforce some sort of international control by using our present position as a bludgeon are rapidly decreasing in number. To swing an atomic bomb as a sort of international shillalah presupposes a willingness to use the bludgeon if we should meet with resistance.

More reasonably, many would like to see our engineering know-how retained until some agreement is reached and then laid on the international table as a token of this country's good faith. Only in that manner, they say, can international control begin in an atmosphere conducive to success.

In any case, it is generally agreed that a foreign government has little to fear, in the long run, from our engineering know-how. It can be duplicated by any major power willing to pay the price.

Should war appear imminent, the price would be eagerly paid.

Should international control fail and an atomic armament race begin, it would make little difference whether we had shared our knowledge or kept it tightly to ourselves. With that fact considered, it becomes readily apparent that we have at the moment little of great value to tell any country.

Science Legislation

The scientists also have a large stake in other legislation before Congress. A Senate Commerce Subcommittee has before it a series of bills, designed to support science, and to integrate the work of scientists in the national economy.

The principal conflict lies in provisions of the Kilgore and Magnuson bills, which differ in the method by which a National Science Foundation, or National Research Foundation, shall be administered. Senator Warren G. Magnuson, Democrat, of Washington, is supported by the scientists in desiring to see control vested in a commission, drawn from the scientists themselves. Senator Harley M. Kilgore, Democrat, of West Virginia, favors the more easily administered control of a director, to whom a commission would serve purely as an advisory body.

In Moscow, Secretary Byrnes is meeting with Foreign Commissar Molotoff and Foreign Secretary Bevin to discuss future relationships between Russia, Britain and the United States—and thereby, inescapably, the immediate future of mankind. On the agenda is the question of Russia's attitude toward the proposed UNO commission for the control of the atomic bomb. It hardly needs to be written down. At every meeting, regardless of what else is talked about, the bomb will be almost visibly on the table. Like Banquo's ghost, it cannot be excluded.

While these talks are going on time does not stand still. The clocks tick and the hours strike at those vast and sinister factories which a little over two years ago began to take shape in Eastern Tennessee. The public knows the site of those factories as Oak Ridge, but the pioneers long ago named a section of its 59,000 acres Happy Valley. Happy Valley did not go out of business when Japan surrendered. As Prof. Harold Urey testified before the McMahon committee, "We are making bombs and storing them." With every day that passes the destructive powers of the United States increase. With every day that passes the need becomes more clear for placing the atomic bomb under some form of international control which can be counted upon to work.

Oak Ridge is out of bounds for most of the American people. The plants are closed to all but a trusted and chosen few. Men and women working there do not fully know what they do. Whether or not this policy of secrecy has been carried too far, whether there is, in fact, any secret, the layman cannot know. We are in the hands of the experts and let us hope also in the hands of the wise. But every American who is concerned about the future of his country, and the future of civilization, should visit Oak Ridge in spirit and should think about the implications of what is going on there.

What a visitor actually sees that is new and raw upon the eroded landscape is a sprawling city built to accommodate 75,000 people and now inhabited by a little more than half as many; removed from the center of this city by four to fifteen miles he sees mighty structures, one with walls three miles long and enclosing 600 acres, others closely grouped over 500 acres, still others smaller and scattered but none the less lethal, a single steam-power plant that is the equal of two Norris dams, TVA electric lines marching over the hills with strength enough to run a big city; and here and there, under the ragged autumnal tree horizons of the ridges, on ruined lands grown up to sedge, in little communities where not long ago TVA was organizing demonstration farms to rebuild soil and human life, he sees the cabins and houses of the pre-atomic settlers and the graves of the pre-atomic dead. This is a new kind of farming and a new crop.

The people have not changed, except as they have learned new skills and come closer to motion-picture theatres, modern schools, modern stores, a modern hospital. Most of them come from stock that has lived long in these hills. A few years back, through no fault of their own, they were existing on their worn-out land under conditions not too different from those of a century gone by. Now, by a stupendous leap, they have been projected into the twenty-first century. On one side of a certain highway there are tall stacks to dissipate the radio-active fumes from one process of atom splitting. On the other side is a plain log cabin, chinked with clay and whitewashed—and lived in less than three years ago. The centuries jostle each other. A visitor may well wonder if the splitting of atoms in Happy Valley has done humanity as much good as the older-fashioned art of splitting logs.

The land was worth \$40 an acre when the Government took it over. What is it worth now—more or less? Is it pos-

sibly worth so much less that the two billion and more dollars spent on the atomic bomb are small change? Is it worth hundreds of billions of dollars less, millions of lives less? The answer must depend on how we adjust relationships between the centuries that are here in juxtaposition and in conflict. A log cabin is not in itself an evil thing—it is picturesque, it may even be comfortable, in this open country it is better than a dark hole in a city slum, it is sweeter to live in a log cabin in a world at peace than in a palace in a world menaced by the atom bomb. But how about log-cabin thinking, not just across the road from a plutonium plant but under the roof of the plutonium plant, and in the legislatures and executive departments of governments controlling plutonium plants?

Log-cabin thinking a century ago could do comparatively little harm. What if those who lived beyond the ridges were unfriendly? One never saw them. One kept one's place, raised corn and potatoes, caught fish, hunted deer, cut firewood. But the split atom and its allied instruments have abolished ridges, plains and oceans. Happy Valley, remote and placid, sheltered from the winds that sweep the earth, struck the blow that wiped out Hiroshima. The son of the pioneer strides the world, and from where he stands can kill deer—and people, and cities, and hope—on any continent, on any island.

Happy Valley can be a beautiful symbol or an evil and mocking one. It can represent civilization flowing in and redeeming hungry areas. And it can represent death. This alternative is basic in any honest thinking as to what is to come. Goodness and mercy, justice and freedom are still possible. But first the old prejudices, the old fears, the old jealousies, the old isolationism, yes, and the old unabated sovereignty of nations, must perish. It is twilight over Oak Ridge, over Happy Valley, while we make bombs there. The hurrying hours and days must soon decide whether it is the twilight of sunset or the twilight of dawn.

SCIENTISTS AND SENATORS PUZZLE OVER ATOM CONTROL

Washington Hearings on Nuclear Energy Seek Answers to Basic Questions

NYT

By ANTHONY LEVIERO

12/16

WASHINGTON, Dec. 15—The current hearings on nuclear energy resemble a series of Platonic dialogues in which pragmatic politicians and empirical scientists think out loud, preparing for a new code of international ethics by which the nations of the world may live in the atomic era. Both the Senators and the physicists admit that the task is more than difficult and publicly confess their shortcomings in the face of so transcendent a problem.

Whatever comes out of the deliberations will have historical import affecting the success of the United Nations Organization and the ability of mankind to live in peace.

The problem, however, to scramble a phrase used by one of the committeemen, is to work out a plan for the world as it is, in order to make the world what it ought to be.

Essentially, the mission of the Senate's Select Committee on Atomic Energy is to create a system of control that would forever prevent the use of a weapon that can wipe out a city in one instant of stellar heat and blast and destroy the substance and sovereignty of a nation in an afternoon.

No Partisan Taint

If the committee writes a practical policy, acceptable to all countries, it will pretty much lay the foundation for the brotherhood of man. The mental struggle that goes on as the committee and witnesses cope with so unusual a thesis often gets excruciating for the onlooker and must be painful occasionally for the participants.

The nature of the hearings is almost unprecedented in the annals of Congress. As yet there has been no partisan taint. There is no draft of legislation ready that might give cause for haggling. The atmosphere is ideally academic and the lengthy dialogues between the witness and this or that Senator are on an elevated plane.

Occasionally a witness bristles under the searching interrogation from the Senators on the horseshoe bench, but the chairman, Senator Brien McMahon, will use his most mollifying manner to explain that every conceivable aspect must be scrutinized. Sometimes Senator Edwin C. Johnson says to a witness: "You scientists have got the world in a mess and now you want

the politicians to straighten it out."

Senator Johnson smiles when he says that, concealing any unhappiness he may feel over the atom that splits. But his remark invariably starts a dialogue on the laws of nature. Natural phenomena is there and man sooner or later uncovers it; there is no repressing it.

Recently the witnesses have been physicists, those of the first and lesser magnitudes, who helped to produce the atomic bomb. They can explain all the fearful things that go on in the sun—or in the invisible atom. They have been summoned, as men who have a special insight into the laws of nature, to assist those who write the political statutes.

"Or Else" Alternative

The scientists are asked to present a plan for political control of nuclear energy and to describe the "or else" alternatives if control fails. So they say that the capital's Federal triangle of beautiful public buildings, with the Treasury at the apex and the Capitol at the base, would be converted into two feet of rubble in an instant. Or, on another scale, one nation will handily conquer the world, destroying much of it in the endeavor, and then will have the difficult task of policing the earth and ruling the survivors.

The plans for control, which would prevent these Wellsian catastrophes, are thoughtful and carefully written, the work of men who are professionally faithful to the principle of exactitude.

Some suggest preparatory conferences between the big powers before control is worked out; some would begin with the Security Council of the United Nations; but there is unanimity of opinion for international control is based on faith and good-will, and free exchange of information and scientists. A good beginning, some say, is to disassemble or destroy our atomic bombs.

Applicable in Cancer

The fissionable material used in the bombs, say the scientists, will ultimately solve the riddle of cancer and thus save more lives than have been lost in the late war. Or twenty tons of it may produce as much power in a year as the entire power potential of the United States in a prewar year.

Industrial use of atomic power, however, is trivial and might well be sacrificed, the physicists say

pleadingly, if such a sacrifice would prevent a war that would shake civilization.

What would happen, ask the Senators, if we destroyed our stockpile of bombs and some nation constructed some secretly and then attacked? Suppose nuclear energy is developed for industrial and humane purposes all over the world. The plants would need only a 25 per cent conversion to produce atomic bombs within six months.

If international control broke

down, what then? Why should we throw away our most effective weapon, which could win a war with a minimum of casualties? We are not an aggressor nation, so why not keep the bomb as a moral preventive? How could an inspection system work when you say a man can sneak across a national frontier with an atomic bomb in a suitcase?

The Answers

The witnesses answer these questions with varying effectiveness;

or they have no answer. Or the answer is riddled to shreds by mention of some seemingly unchangeable fact. One answer may beget a score more questions.

The Senators say the questions are mainly hypothetical, designed to help them to come up with the right answer when they write the policy and the law. When they are finished with the physicists they plan to call political scientists, and one of them probably will be the Secretary of State.

SENATORS DEMAND RUSSIAN ATOM VOW

Insist Byrnes Get Pledge on
Factory Inspection Before
Giving Out Information

NYT 12/20
SHARP CLEAVAGE SHOWN

Some Fear Secretary Aims at
Frank Discussion Without
Guarantees Held Vital

By JAMES B. RESTON

Special to THE NEW YORK TIMES.

WASHINGTON, Dec. 19—The

leading members of the Senate Foreign Relations Committee have told the Administration that they believe Soviet Russia must agree to open her atomic bomb laboratories and factories to international inspection before we disclose any more important information to her about the bomb.

In a long and sometimes angry meeting with Secretary of State James F. Byrnes on the eve of his departure for the current Moscow discussions, a subcommittee of the Foreign Relations Committee insisted that this right of constant inspection must be guaranteed as a fundamental preliminary to any frank discussion of atomic bomb secrets in Moscow.

Mr. Byrnes evidently did not reject the principle of constant inspection as a means of controlling the future development of atomic bombs, but he left some doubt in the minds of members of the committee about his willingness to insist on guarantees of the right of inspection before speaking frankly to the Russians about the atomic bomb, and this doubt led to the sharpest discussion yet held between Mr. Byrnes and his former colleagues in the Senate.

The meeting on the bomb was held at Mr. Byrnes's request just before he left for the Moscow talks and was attended by Senators Tom Connally of Texas, chairman of the Foreign Relations Committee; Walter F. George of Georgia, Elbert D. Thomas of Utah, and Alben W. Barkley of Kentucky, all Democrats; Arthur H. Vandenberg of Michigan, Wallace H. White Jr. of Maine, and Warren R. Austin of Vermont, Republicans; and Robert M. LaFollette Jr. of Wisconsin, Progressive.

In addition to these men, who were chosen by Senator Connally at Mr. Byrnes' request as a liaison committee with the Department of State, the Secretary invited a subcommittee of the Senate Atomic Energy Committee and Brien McMahon, Democrat, of Connecticut, chairman of that committee, headed this particular group.

Mr. Byrnes explained to the delegation that he had asked them to call on him to tell them what he proposed to say to the Russians about the atomic bomb.

Senators attending the session

got the impression that Mr. Byrnes proposed to assume Russian cooperation in international control of the bomb and to discuss the bomb with them in a fairly frank fashion in the hope of allaying Russian suspicions of our atomic bomb policy and as a means of creating an atmosphere conducive to the settlement of other questions that have been disturbing United States-Russian relations.

Some of the Senators immediately suggested that the Secretary should not assume anything regarding Russia's cooperation, but should insist that no nation could expect to share in the international control of atomic energy that did not grant to a commission of the United Nations the right to inspect, investigate and discover at all times what that nation was doing with the development of atomic weapons.

Disagree on Intentions

Furthermore, these Senators emphasized, no additional secrets about the bomb should be discussed until an international policy was worked out; the policy should be made, not piecemeal but as a whole.

Moreover, two of the Senators present said that they not only disagreed with Mr. Byrnes's intention, as they interpreted it, to talk frankly about the bomb to the Russians, but disagreed with the manner in which he was advising them about it. They were under the impression, they said,

that the Foreign Relations subcommittee had been created to "consult" with the executive branch of the Government on policy and not merely to be "informed" about what had been decided.

After this, opinions were expressed on both sides with considerable vigor, but the controversy narrowed itself down to whether the guarantees of the rights of inspection should be given as a prior condition of further frank discussion with the Russians about the bomb or whether Mr. Byrnes should be free to go to Moscow and talk frankly about the bomb before getting that binding commitment.

Senators who were present at the meeting agreed that there were three points on which the Secretary and the delegation agreed: First, that the future of atomic energy was the concern of all nations and consequently should be subject to some form of international control; second, that the United Nations Organization should be the agency of control; and third, that the UNO Atomic Bomb Commission proposed by President Truman and Prime Ministers Attlee of Britain and W. L. Mackenzie King of Canada was a step in the right direction.

Also some members of the delegation seem to be satisfied that Mr. Byrnes agreed with them that the right of inspection was inseparable from any safe system of in-

ternational control. He is said to have agreed that we could not lift our barriers on the manufacturing secrets of the bomb and then permit the Soviet Union or any other nation to benefit from our information only to establish barriers of their own against our inspection of their atomic bomb factories and laboratories.

But other members of the delegation got the impression that Mr. Byrnes was prepared to start exchanging scientific information and scientists with the Soviet Union in the near future before he had binding guarantees about the right of inspection and it was this doubt that produced the controversy and sent the committee away determined to insist on the prior guarantee before Mr. Byrnes had a chance to get to Moscow.

Since then there have been several exchanges within the executive branch of the Government about where in the conversations with the Soviet Union this demand for guarantees of the right of inspection should come, and the official line here now is to say that everything is settled and everybody understands everybody else.

On Capitol Hill the story is slightly different. Several powerful members of the committee are still uncertain about what Mr. Byrnes proposes to say in Moscow and where Mr. Truman stands in the controversy. Moreover, while the executive branch of the Government seems to be moving away from its original unilateral approach to the problem and toward a more liberal international policy, the powerful Foreign Relations Committee seems to be insisting on a clearly defined set of agreements and guarantees.

Uncertainty Persists

This controversy has not broken the trend toward continued collaboration between the committee and the State Department on formation of American foreign policy. Both the chairman of the committee, Senator Connally, and one of the leading Republican members of the committee, Arthur Vandenberg, both of whom opposed Mr. Byrnes in the atom discussions before he left, were appointed today as delegates to the United Nations Assembly meeting in London next month.

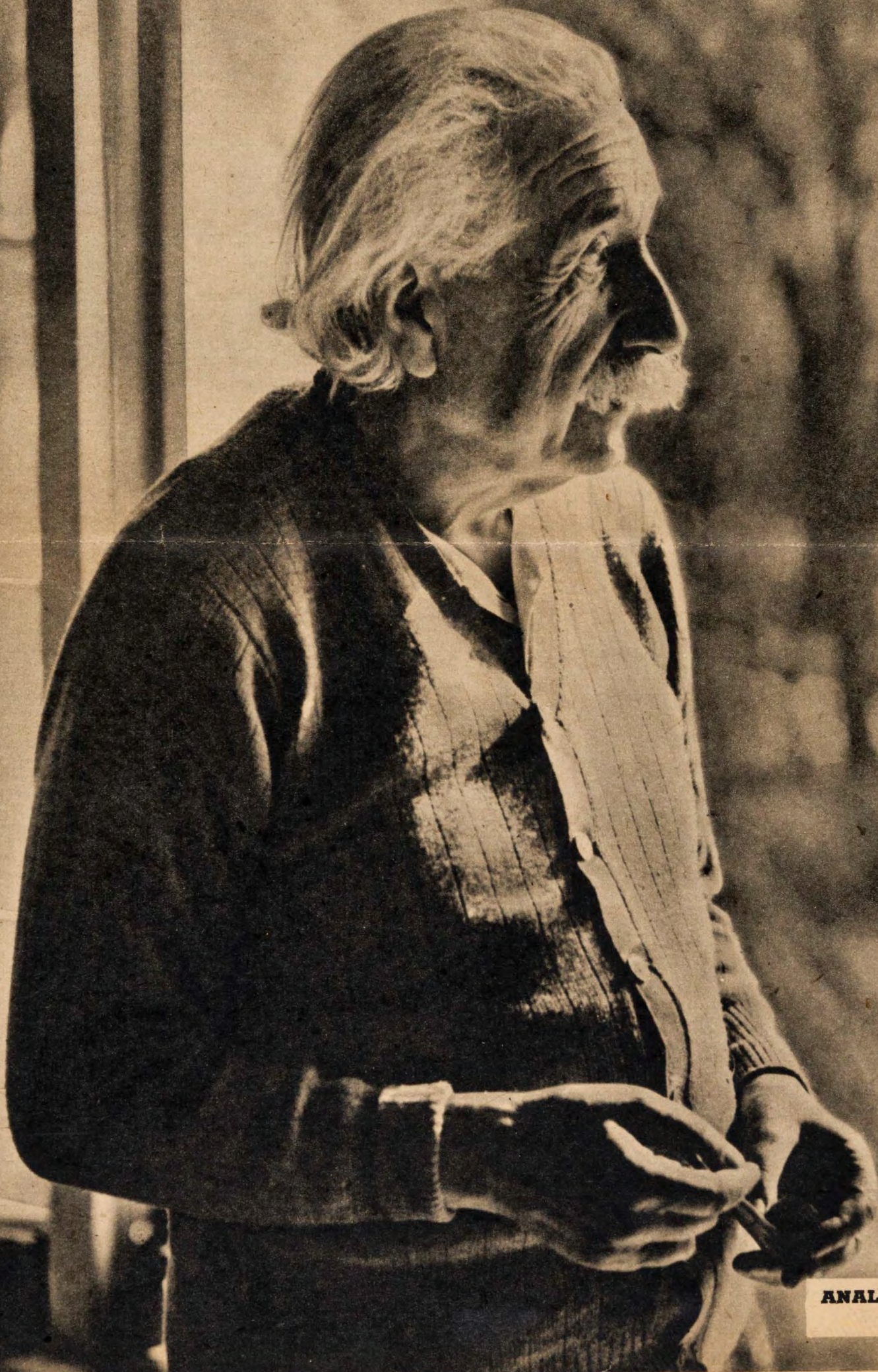
But the friendly atmosphere of past meetings with the bi-partisan Foreign Relations subcommittee has been broken, and it appears that the Executive Branch of the Government now finds itself on the atom question somewhere in the middle between the liberal atomic scientists and the conservative Foreign Relations Committee.

The New York Times Magazine

January 1, 1950

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SECTION 6



ANALYST OF THE COSMOS
[See Page 2]

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Letters

"TO RIF"

TO THE EDITOR:

In Robert G. Whalen's "Where Were You the Night of April 23, 1935?" one of the German psychologist Ebbinghaus' "nonsense" words proved not to be so nonsensical, after all. Ask any Federal Government employe what it means when he receives his Reduction In Force letter, and he will say, "I've been rifed," past participle of the verb "to rif." (Miss) FLORENCE LIPKIN. New York.

WELFARE CLAUSE

TO THE EDITOR:

An error by Senator Paul H. Douglas ("Are We Headed Toward 'Collectivism'?") should not be permitted to pass without correction. After quoting from the Preamble to the Constitution and wrongly implying that it conferred a grant of power, he went on to say:

"That this was not a slip of the pen is clearly shown by the fact that in Art. I, Sec. 8, in enumerating the powers of Congress, the Constitution again states that 'the Congress shall have power * * * to provide for the common defense and general welfare of the United States * * *'"

In making the elision indicated by his asterisks, Senator Douglas painfully perverts the meaning and the reading of the clause, which is as follows:

The Congress shall have power (1) to lay and collect Taxes, Duties, Imposts and Excises, to pay the Debts and provide for the common defense and general welfare of the United States; but all Duties, Imposts and Excises shall be uniform throughout the United States.

Thus the clause, as the language and the concluding restriction make clear, is confined to the raising of revenue and the purposes for which the proceeds may be spent. To twist it into a general power to regulate for the general welfare is to make superfluous all the succeeding grants of

more specific and particular regulatory powers.

T. R. POWELL.
Cambridge, Mass.

CARUSO

TO THE EDITOR:

Giovanni Imparato ("A Fifth Viola's View of an Orchestra") makes an attack on a supreme artist. He writes: "The good musician keeps firm control of his emotions and does not let them slop over in the fashion of Caruso." When Caruso gave an emotional effect to his singing, as indeed he did, he was performing in the norm of operatic delivery. This should



"A Master"—Enrico Caruso.

not imply that he did not have "firm control" of his emotions or was "slopping over." When any musician duplicates the ineffable musicianly phrasing of which Caruso was a master then he too will be classed among the immortals.

G. MARESCHAL.
Philadelphia.

BELGIAN PARTIES

TO THE EDITOR:

Foster Hailey, in "Belgium Debates a King's Destiny," makes two statements which I believe need clarification.

He wrote: "A royal commission studied all available documents in the case three years ago and issued an opinion." In fact, the commission was appointed by and was responsible to Leopold. Its findings have not been published in full. The Socialist demand for a nonpartisan parliamentary

commission has thus far gone unanswered. Leopold's implicit encouragement of collaborationist journalists and his belief in and acceptance of a Nazi victory have not been disproved.

He wrote: "The [royal] question played an important part in the defeat last July [June 26] in the Belgian general elections of the Socialist Government that had been in office since the war." Although the Socialists have been in office since the war, they have always been part of a coalition—first with the Liberals and Communists, then with the Catholics. They have been and still are the second largest party.

Actually, the Socialists lost less than 2 per cent in the last election and the Catholics won 1 per cent over 1946. The real winners were the Liberals, who campaigned for tax reduction and won 15.3 per cent over the 1946 elections.

LEILA SEIGEL.
New York.

MOSCOW FIRM

TO THE EDITOR:

Regarding Harrison Salisbury's "Moscow Mart" and the subsequent correspondence in your columns, the name of the Scottish department store in Moscow before the Revolution was Muir & Mirrielees (not Merrilees) and the senior partners at the time of its seizure by the Bolsheviks were William Cazalet (grandson of Archibald Mirrielees, who started importing British goods into Russia about 120 years ago) and Walter Philips (stepson of Andrew Muir, who was a partner of Archibald's son when the store was opened some seventy years ago.)

Despite presentation of their claims by the British Government, none of the capital invested in this firm has ever been returned to the stockholders. Walter Philips died while still imprisoned in Moscow. William Cazalet escaped from concentration camp, is now 88 and lives in London.

I know these facts are exact because Archibald Mirrielees, born in Aberdeen in 1797, was my mother's father, Andrew Muir her mother's brother. (Mrs.) UNA MIRRIELES BERNARD SAIT.
Palo Alto, Calif.

ART DEALERS

TO THE EDITOR:

I was particularly struck in Georgia O'Keeffe's beautiful tribute to Alfred Stieglitz, "Stieglitz: His Pictures Collected Him," by her statements on the artist-dealer relationship, especially the sentence, "He chose really to take care of a few rather than halfway take care of many." It was wonderful that a man so imbued with a sense of mission was an art dealer, and it was providential that this dealer had an income, small as it may have been.

HARRY SALPETER,
Art Dealer.
New York.

The New York Times Magazine

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THE COVER—Last week Albert Einstein, at 70, was still blazing new paths. He offered a theory designed to bring into one all-embracing concept the two "fields" of gravitation and electromagnetism. The theory has yet to face the test of years.

Moscow Talks Cast Byrnes In Role of Atomic Expert

HT 12/23
Secretary of State Passed 3 Months After Death
of Roosevelt Studying Problems of the Bomb
So He Could Speak Authoritatively at Parleys

By Bert Andrews

WASHINGTON, Dec. 22.—Today, three days before Christmas, while Secretary James F. Byrnes is in Moscow conferring with the Foreign Ministers of Soviet Russia and Great Britain, many observers have had it impressed upon them

anew that Mr. Byrnes went to Moscow with one problem uppermost in his mind.

The problem is that of atomic energy and how to control it for the good of mankind.

Its transcendent importance stands out clearly through the fog of rumors that the conferees are concentrating on the Balkan situation or on a dispute over Turkish territory or over the Japanese occupation question.

Its significance has been emphasized this week by a re-survey of a somewhat mysterious period in the life of Mr. Byrnes, by a study of remarks made by Senator Brien McMahon, Democrat, of Connecticut, and by a scrutiny of testimony given before the special Senate committee on atomic energy by John A. Simpson jr., twenty-nine, physicist on leave from the University of Chicago department of physics.

Mr. Byrnes, it is recalled,

dropped from public view almost entirely for three months back in the spring of this year, so much so that newspaper clippings show this chronology:

April 2—Byrnes resigns as War Mobilization Director.

April 12—President Roosevelt dies. Byrnes may come back into government.

April 13—Byrnes arrives from Spartansburg, S. C., to fill President Truman in on domestic and foreign matters with which he is familiar.

April 16—Byrnes says he has no plans to come back into the government.

June 13—Big Three meeting set. President Truman says Byrnes will be among men accompanying him.

June 30—Byrnes appointed Secretary of State.

Studying the Atom

That made a scant six meetings in three months for a man whose name previously had been mentioned every day for a long time. Where was he and what was he doing during that time? Well, it is known now that he was working secretly in connection with the project that was climaxed by the dropping of atomic bombs on Japan, that he was saturating himself with knowledge about it, that he was storing up this lore against the time he would have to represent the United States in talking about it with men of other nations.

That, briefly, is the answer of the pro-Byrnes men to critics who say he has gone to Moscow "without adequate preparation." They insist that on at least one topic—that of atomic energy—he is thoroughly prepared and completely aware of the need for arriving at some workable solution of the world's toughest problem.

McMahon's Crusade

One of the men who had a part in that preparation is Senator McMahon, forty-two-years old, who knew little about atomic energy before bombs fell on Hiroshima and Nagasaki but who has worked night and day since then to learn all a layman can learn about its potentialities.

Mr. McMahon is earnest in his efforts. He is awed by what he has learned. He is afraid that the people of America really do not understand the power of the force that has been unleashed. He believes that the truth about it should be preached and preached again until every man, woman and child realizes what has come to pass. He has said words that Mr. Byrnes undoubtedly has read and with which he probably agrees. There is one such passage that Mr. McMahon meant with all his heart and mind and he wishes it would be memorized and studied by all who see it.

Mr. McMahon was addressing the Senate. "I say in all seriousness, after profound consideration—and I am careful on this floor never, I hope, to be overstrong in my utterances—I say that the discovery of a method of dividing the atom is the most important event that has happened in the world's history since the birth, the life, and the death of Jesus Christ."

Cites Scientists' Testimony

Mr. McMahon uttered those words after hearing many scientists talk about atomic energy, particularly about its powers for destruction. He does not think enough people paid enough attention to what the scientists said. For example, Mr. McMahon refers

praisals will be sufficient to prevent its use.

"3. No nation under present conditions can maintain its pride and place in the world until it too has atomic energy and has atomic bombs.

"4. Once a nation builds an atomic bomb stockpile large enough to demolish the major cities of potential enemies, no more military advantages result from larger stockpiles. As time goes on, all nations possessing bombs will tend to become military equals.

"5. In any atomic armament race, the United States in the long run will find itself in a very unfavorable position, due to highly concentrated population and industry.

"6. No nation can withstand a large scale atomic bomb attack. It may lose a sizable portion of its population in a few hours of warfare.

"7. In the immediate future, before other countries also have bombs, the United States must always take the lead in reshaping international affairs to obtain world security."

That is part of what Dr. Simpson had to say before the Senate committee. And, without much doubt, Mr. Byrnes is saying something like it to the other Foreign Ministers, Viacheslav M. Molotov and Ernest Bevin.

NYT OATH FOR SCIENTISTS 12/23

It took the destruction of Hiroshima and Nagasaki to arouse the social consciousness of scientists, to convince them that research is a social activity, and to drive home the fact that they can no longer remain indifferent to the consequences of their work. Prof. Gene Weltfish of Columbia suggests in The Scientific Monthly that scientists should take an oath which forbids them to foster racial and other prejudices and to aid anyone in exploiting discoveries for unsocial purposes. Prof. J. A. Ryle of Oxford would have his fellow-scientists adopt some form of charter to guide their consciences. Such proposals are not new. In 1938 L. A. Whyte, once a physicist, framed an "ethical declaration for the times" which recognized no "loyalty greater than that to the task of preserving truth, toleration and justice in the coming world order."

Physicians take the Hippocratic oath and, on the whole, live up to it, chiefly because common people have a stake in medical practice. The case of the physical sciences stands on another footing. Any pledge not to conduct research in chemistry or physics for unsocial purposes would have to be accepted by the scientists of the whole world. Would such a pledge be effective? Thousands of young Englishmen took the Oxford oath, yet all but a few conscientious objectors went to war. Dr. Anna O. Shephard wonders in The Scientific Monthly how oathbound atomic physicists would have conducted themselves, knowing as they did that the Germans were developing a uranium bomb.

No scientist can foresee all the uses to which his discoveries may be put. Clerk Maxwell and Hertz never suspected that some day radio waves would be used to steer rocket bombs and to give blockbusters television eyes that literally see a target; and the Curies never dreamed that they were paving the way for an atomic explosive. Moreover, it is impossible to draw the line between the military and industrial application of knowledge in total war. Alloy steel is as necessary for industrial machines as for battleship armor; electron tubes are as necessary in controlling factory processes as in directing the fire of an anti-aircraft battery.

Though Winston Churchill and others in high places have publicly resented the intrusion of atomic physicists into politics, the only way to deal with the abuse of science is politically. Encouraged by "pure" scientists, statesmen have treated physics, chemistry and biology as if they stood apart. Oaths not to engage in unsocial scientific activities will do no good, but the free discussion of the social effects of science will. In the end it is public opinion that decides what is good and what is evil, for which reason scientists ought not to rest content with statements of technical facts in papers that very few understand.

Moscow Talks Cast Byrnes In Role of Atomic Expert

Secretary of State Passed 3 Months for Profits and Pre-emption
of Roosevelt Studying Problem He Served Country
So He Could Speak Authoritatively

By Bert Andrew

WASHINGTON, Dec. 22.—Today, the while Secretary James F. Byrnes is in Moscow, the Foreign Ministers of Soviet Russia and Great Britain have had it impressed upon them anew that Mr. Byrnes went to Moscow with one problem uppermost in his mind.

The problem is that of atomic energy and how to control it for the good of mankind.

Its transcendent importance stands out clearly through the fog of rumors that the conferees are concentrating on the Balkan situation or on a dispute over Turkish territory or over the Japanese occupation question.

Its significance has been emphasized this week by a re-survey of a somewhat mysterious period in the life of Mr. Byrnes, by a study of remarks made by Senator Brian McMahon, Democrat, of Connecticut, and by a scrutiny of testimony given before the special Senate committee on atomic energy by John A. Simpson jr., twenty-nine, physicist on leave from the University of Chicago department of physics.

Mr. Byrnes, it is recalled,

still feels handy with his gun and commits murder or goes out and robs a bank."

Now this is certainly exaggerated, unfair and one-sided. Yet it is a kind of sentiment that is running more and more strongly in the letters and conversations of men back from the wars. Very few of them commit murder or rob banks; a man with different prejudices from our sailor will berate the manufacturers rather than the union leaders, attack the black marketeers rather than the long-suffering O. P. A.; but the fundamental pattern remains the same. Both men have achieved the ambition of years—to become civilians again; and they don't like it.

A further insight into this situation comes from another returned service man, an older and more experienced observer, who finds that veterans and civilians are alike in their bewilderment:

"These are the questions they will ask you on every street corner."
(Continued on page 2, column 1)

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name

tioned every day for a long time. Where was he and what was he doing during that time? Well, it is known now that he was working secretly in connection with the project that was climaxed by the dropping of atomic bombs on Japan, that he was saturating himself with knowledge about it, that he was storing up this lore against the time he would have to represent the United States in talking about it with men of other nations.

That, briefly, is the answer of the pro-Byrnes men to critics who say he has gone to Moscow "without adequate preparation." They insist that on at least one topic—that of atomic energy—he is thoroughly prepared and completely aware of the need for arriving at some workable solution of the world's toughest problem.

McMahon's Crusade

One of the men who had a part in that preparation is Senator McMahon, forty-two-years old, who knew little about atomic energy before bombs fell on Hiroshima and Nagasaki but who has worked night and day since then to learn all a layman can learn about its potentialities.

Mr. McMahon is earnest in his efforts. He is awed by what he has learned. He is afraid that the people of America really do not understand the power of the force that has been unleashed. He believes that the truth about it should be preached and preached again until every man, woman and child realizes what has come to pass. He has said words that Mr. Byrnes undoubtedly has read and with which he probably agrees. There is one such passage that Mr. McMahon meant with all his heart and mind and he wishes it would be memorized and studied by all who see it.

Mr. McMahon was addressing the Senate. "I say in all seriousness, after profound consideration—and I am careful on this floor never, I hope, to be overstrong in my utterances—I say that the discovery of a method of dividing the atom is the most important event that has happened in the world's history since the birth, the life, and the death of Jesus Christ."

Cites Scientists' Testimony

Mr. McMahon uttered those words after hearing many scientists talk about atomic energy, particularly about its powers for destruction. He does not think enough people paid enough attention to what the scientists said. For example, Mr. McMahon refers to a paragraph from the testimony of Dr. Simpson, which reads:

"Atomic weapons are effective weapons for warfare. Their effectiveness can be increased to the point where any nation can destroy any other nation with atomic bombs."

Senator McMahon wonders how many readers actually will stop to analyze that sentence, to drain it of its meaning, to take it apart, word for word, to see just what the words portend.

To him "any nation" means any small, middle-sized or big nation that happens to get enough bombs. "Destroy" means to smash completely, to wipe out. "Any other nation" means that no nation, no matter how powerful, would be immune from destruction at the hands of any other nation, no matter how small, possessing the bombs.

That was not all of Dr. Simpson's testimony. He offered the following conclusions in testimony which presumably was among the many relevant matters studied by Mr. Byrnes before his departure:

"1. In a world of nations having
(Continued on page 2, column 1).

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Laboratory Experiments With Uranium Gave Us a Head Start in the Atomic Bomb Race

NYT

By WALDEMAR KAEMPFERT

12/23

When they decided to erect a big uranium "pile" and to bombard it with neutrons to produce material for an atomic bomb, the scientists turned to the Westinghouse laboratories. That was the only place where pure uranium could be obtained. Prof. H. D. W. Smyth tells part of the story in his official report on the bomb. Now comes Dr. Harvey C. Rentschler, Westinghouse director of research, with the rest.

"Shortly after World War I, it was suggested to us that uranium might prove to be a better lamp filament than tungsten," says Dr. Rentschler. "At that time, almost nothing was known about uranium's physical properties and its melting point was not established within several hundred degrees. Moreover, it was unavailable on the market in pure form presumably because reduction of uranium from oxide ores is an extremely difficult process."

In May, 1922, Dr. Rentschler and Dr. John W. Marden, assistant research director, refined their initial samples of the precious new element from uranium salts, never dreaming that they would give American physicists a head start in the race toward history's grimmest goal.

A Few Ounces Produced

"We had worked for four years before we found a way to make pellets in pure form so that they could be fashioned into lumps or rolled into foil or rods," Dr. Rentschler says. "After tests of our first batches, we discarded uranium as a lamp filament possibility, because its melting point was only 2,102 degrees Fahrenheit as compared with the 6,332-degree melting point of tungsten." Nevertheless work was continued. A few ounces of refined metal were produced at a time to meet the demands of colleges and research laboratories which were conducting experiments in nuclear physics.

Early in 1942, Dr. Rentschler received a telephone call from Dr. Arthur H. Compton, director of the atomic bomb experimentation at the University of Chicago. "How soon can Westinghouse supply three tons of pure uranium?" asked Compton. Dr. Rentschler was aghast. Up to that time, the output had been at the rate of a few thumb-size buttons of the highly precious ore at a time.

Dr. Marden set up a uranium "factory" in a corner of the laboratory. Within the course of a few months he had increased the output from eight ounces a day to more than 500 pounds and cut the cost from \$1,000 a pound to \$22 a pound.

Dr. Rentschler's staff supplied more than three tons of pure uranium for the Chicago Metallurgical Project Office, the official name by which Dr. Compton's enterprise was known. It also supplied uranium for the pioneering work on the atomic bomb conducted at Princeton University. Makeshift devices had to be employed because there was no time to design and build machinery. So wooden wash tubs, automobile jacks and sun lamps, among other things, went on the scientists' procurement list.

First Step on Plant Roof

The first step in processing was to place a liquid solution of uranium salt and other chemicals in tubs on top of the plant roof. There the photochemical action of the ultraviolet in sunlight—on cloudy and rainy days a sun lamp was used to produce the ultraviolet—converted the transparent liquid into a green powder, which was potassium uranium fluoride.

Then the automobile jack came into use. It elevated the electrodes for the process during which the uranium salt was melted in a graphite cup. The uranium was deposited electrolytically from a fused bath on an anode, then melted and cast.

The project was closed in February, 1943, after other methods for producing the metal on a large scale were developed. But as long as it was operating, the area in which "Metal X," as the workers knew it, was manufac-

ture was the center of the most secret activity in the plant.

Senator Sees Bomb Driving Navy Undersea

Johnson of Colorado Says Even Carriers Must Go Under Water to Survive

From the Herald Tribune Bureau

WASHINGTON, Dec. 26.—Senator Edwin C. Johnson, Democrat, of Colorado, member of the Senate Atomic Energy Committee, declared today that the atomic bomb made obsolete "every surface ship in the Navy" and predicted future warships would be completely undersea craft capable of "tremendous speeds" because they will be powered by atomic energy. Harnessing of atomic energy for power purposes, he added, "is only a step away from practicality."

Senator Johnson, who also is ranking member of the Senate Military Affairs Committee, said the big drawback in using atomic energy as a steam propellant was the discharge of deadly gamma rays.

"Scientists have got it practically harnessed—they have it all worked out to convert it into steam and to escape the gamma death rays," Senator Johnson said. He added such power would enable submarine craft to escape detection more readily than can electrically propelled vessels.

Senator Johnson predicted that one small submarine equipped with atomic bomb rockets could sink an "entire navy." Therefore, he asserted, "I am very certain that transport and supply ships, as well as combatant vessels, including battleships and aircraft carriers, will have to go under water."

"There is a new kind of navy coming up and it will be more formidable than ever, and many admirals I have talked to think the same," he declared.

Assails Bomb "Secrecy"

WASHINGTON, Dec. 26 (UP).—The National Lawyers Guild criticized tonight American "secrecy" about the atomic bomb and urged that control of atomic energy be placed with the Security Council of the United Nations.

"It is the responsibility" of Secretary of State James F. Byrnes at the Foreign Ministers Conference to seek agreement that control of atomic energy be vested in the Security Council, it said in a statement.

The Nov. 15 Washington declaration on Atomic Energy was "a departure from the entire structure of the U. N. O. organization," and substituted an "Anglo-American bloc" for the principle of the Security Council, the Guild said. The Foreign Ministers Conference has offered an opportunity to re-establish the principles of the United Nations Charter, it added.

It said the United States atomic bomb policy had antagonized the Soviet Government, alarmed the French government and "created disquiet" among the English.

Germany's Oak Ridge



Wooden building on the outskirts of Berlin where German scientists carried on their war-time experiments in nuclear fission. The sign in front of the shack says, "Halt. Approach Forbidden"

Nazi Scientists Gave Up Hope On Atom Bomb

But U. S. Army Aide Says They Hid This to Obtain More Funds From Party

By Stephen White
A Staff Correspondent

CAMBRIDGE, Mass., Dec. 26.—German science, when the war ended, was stumbling down the road toward atomic energy, headed in the right direction but traveling so erratically that success was years away.

When Allied troops put an end to German research the Nazi nuclear physicists, working on starvation budgets and harried by their party leaders, had reached the stage of experiments on an atomic-energy pile. America had passed through that stage in July, 1941.

The sorry tale of the German effort was related today by Dr. Samuel A. Goudsmit, professor of physics at the University of Michigan, discoverer of the so-called "spin of the electron," and scientific chief of the War Department's ALSOS mission. Dr. Goudsmit headed thirty scientists who accompanied American troops into the fighting lines for information concerning enemy science.

Dr. Goudsmit could not tell the manner in which his information was collected, but his home in Cambridge is littered with originals and photostats of pertinent material. From that material, annotated with his own recollection, a narrative of the German work can be put in order.

Work Began in 1939

The German effort, like America's, began in January, 1939, when Otto Hahn, director of the Kaiser Wilhelm Institute for Physics in Berlin, discovered the fission of uranium by bombardment with neutrons. This was the raw material of an atomic bomb or atomic energy, and its significance was not lost in Germany or anywhere else.

German scientists eagerly set to work, adding a trace of personal espionage to their attempts. In the spring of 1939 Dr. W. Heisenberg, Nobel Prize winner and one of Germany's best-known nuclear physicists, came to this country, accompanied by Dr. W. Bothe. It was not known at the time, but has since been learned, that their mission was no amiable visit. They wished to find out whether this country was officially subsidizing work on atomic energy. At the time America was not; the two learned doctors returned to Germany and so reported. Germany never thereafter suspected the amazing American progress in the field.

By the time the war began the German effort had been channeled into two main programs. At the Kaiser Wilhelm Institute, Heisenberg and a handful of first-rate scientists were at work. Competing against them, under Army Ordnance, was a second group, led by Dr. Erich Schumann, a second-rate physicist surrounded by third-rate assistants. The two groups competed for favor and for funds and co-operated as little as possible.

The Germans made little effort to conceal the fact that work on nuclear physics was in progress. On the contrary, it became so well known that it became fashionable—the postal department, under its head, Ohnesorge, carried on work, and one Baron Manfred von Ardenne helped out in his private laboratory.

Gave Up Idea of Bomb

The scientists very quickly gave up the idea of an atomic bomb. They reached the conclusion that never, in their lifetimes, would it be possible to separate enough U-235 from U-238 for a working bomb. But atomic energy still was a possibility, and they continued their work. Nazi party leaders were told that a bomb was still a possibility—the scientists did not believe any such thing, but wanted appropriations.

They never did get money, on the American scale. During the years of the war 15,000,000 marks were spent on the entire project—about \$7,500,000 in buying power. In 1944-'45, while this country spent \$1,000,000,000, Goering reluctantly set aside \$1,600,000 for

nuclear research, later adding another \$500,000.

They tried for more money. In February, 1942, they made their major effort. For Nazi party higher-ups they scudged a luncheon, to be preceded by technical discussions of atomic energy. The speakers and their subject matter would be welcomed at any scientific gathering: they included Hahn on uranium fission; Heisenberg on the theory of energy release; Dr. H. Geiger on the need for fundamental research; Dr. Bothe on chain-reacting piles.

Unfortunately, the luncheon was not as attractive as the meeting. Most of the food was cooked in synthetic fat, and liberally augmented with ersatz of one kind or another. Not one of the party leaders attended. There was no further appropriation.

Every Pfennig Counted

Work proceeded slowly, with every pfennig carefully counted. Heisenberg was saddled with inefficient party favorites and had to devote a good part of his time talking the Nazis out of hare-brained scientific schemes.

One of them was a plan to direct X-rays at Allied aviators, causing fatal burns at 30,000 feet. Another would have used infrared rays to blow up munitions dumps. Both were fantastic.

As in this country, experiments were first made with uranium oxide and heavy water. The two groups then went on to construct piles with uranium metal. Heisenberg's group used uranium strips and Schumann's group, uranium cubes. Neither pile was chain-reacting, but much to Heisenberg's chagrin the second-rate scientist under Army Ordnance achieved somewhat better results.

Both laboratories were attempting to improve their results when the war ended. Both were certain that Germany was far ahead of the rest of the world in progress made. This country, meanwhile, had finished preliminary work, constructed a large-size chain-reacting pile, built plants for the separation of U-235 and U-238 and was about to try out its first bomb in New Mexico.

Name Is a Mystery

Dr. Goudsmit told his story with high glee. A native of Holland, he is obviously no lover of Germans or German methods.

The thoroughness with which his ALSOS mission did its work, he said, could be laid to its commanding officer, Colonel Boris T. Pash, of the General Staff. Colonel Pash, with twenty officers and fifty men, was responsible for getting the scientists where they wanted to go when they wanted to go there. The men would take whatever objective the scientists called for, and the work of investigation would go on from there. Dr. Goudsmit joined the mission in May, 1944, and was in charge of scientific work until the war ended.

The War Department has never officially revealed the reason for naming the mission ALSOS. In Greek the word means "Groves," so that any one who wishes to accept the name as a mild tribute to Major General Leslie R. Groves,

head of the atomic-bomb project, can have a good argument on his side.

Dr. Goudsmit gave it as his personal opinion that the Germans ultimately would have stumbled their way to success in the release of atomic energy. Further investigation, he added, might have led them back to work on an atomic bomb. But so far as the last war was concerned, they were never even close.

Princeton Men Honored

45 Research Chemists Receive Pins for Atom Bomb Work

Special to the Herald Tribune

PRINCETON, N. J., Dec. 26.—The role of Princeton University in the development of the atom bomb has been officially recognized by the War Department with the award of pins and certificates to forty-five research chemists of the university, it was announced today.

Under Dean Hugh S. Taylor, chairman of the chemistry department, and N. Howell Furman, the Russell W. Moore professor of chemistry, the Princeton men worked out improvements in concentrating heavy water in developing analytical methods for manufacturing and testing materials and on Uranium-235 itself. Twenty-seven men received silver pins for eighteen months' service, and eighteen other received bronze pins for six to eighteen months on the job. All received certificates of service.

They expressed confidence that legislation acceptable to scientists holding divergent views could be worked out, and pointed out that the various bills now under consideration by the Kilgore-Magnuson Senate sub-committee agree on six major points, which could be used as a basis for drafting a satisfactory measure.

Copies of the statement, which was released by the Committee for a National Science Foundation, formed at the invitation of Dr. Urey and Dr. Harlow Shapley, director of the Harvard College Observatory, have been sent to Senators Harley M. Kilgore, Warren G. Magnuson, Edwin C. Johnson of Colorado, Claude Pepper, J. William Fulbright and Leverett Saltonstall, the announcement said.

Federal Aid Held Essential

The text of the statement follows:

Knowledge secured by research has achieved public recognition as the necessary foundation of sound programs for national welfare, health, security and world order. It is clear that the magnitude of the research task which must be accomplished promptly in the interest of the nation and of civilization requires expenditures so great that government aid is required. The extensive public hearings just completed in Washington under the joint chairmanship of Senators Kilgore and Magnuson collected testimony from all sides which emphasized this point. Because it is believed that the public may be in doubt concerning the views of research men on the feasibility and practicality of scientific advance under government auspices, the following statements are made in the conviction that they are supported by the judgment of a majority of scientists:

1. Federal support of research must supplement funds for scientific inquiry from private philanthropic and business sources if science is to make its essential contribution to the welfare and security of mankind in the difficult years ahead.
2. The freedom of inquiry upon which science is dependent can and must be guaranteed for research under government no less than private auspices.
3. The government should support research in all fields of fundamental scientific inquiry relevant to national interest without arbitrary exclusion of any area.
4. Scientific findings resulting from Federally financed research activities should receive publication and should be dedicated to the welfare of the public.
5. The training of research personnel through national scholarships and fellowships for undergraduate and graduate study should be open to all on the basis of ability and scholastic achievement, and should be available for work in any qualified institution in any recognized field of science.
6. Although there is a serious division of opinion on the question whether administrative responsibility should be given to a governing board or to a single administrator, it should be possible to devise a plan of organization which will meet the major objections to either alternative.

Truman's Message Cited

These six points are in harmony with that part of President Truman's message of Sept. 6 to the Congress which urged the early establishment of a Federal agency to promote and support scientific research and aid to training of research personnel. An analysis of the testimony presented at the public hearings under the joint chairmanship of Senator Kilgore and Senator Magnuson on pending bills indicates that there is sufficient agreement on these points to justify their utilization as a basis for legislation.

It is the conviction that the passage of Federal aid to research is essential to the national interest and that legislation acceptable to all who hold divergent views about particular questions of function and organization can be drafted. We stand ready to cooperate in the revision of the bills recently considered at the Senate hearings on pending national science legislation. Our purpose is to serve the national interest by securing the collaboration of the maximum number of qualified scientists in a united attack on the scientific problems confronting the nation.

SCIENTISTS OFFER TO AID LAWMAKERS

200, Including 5 Nobel Prize Winners, Stress Need for National Legislation

NYT 12/28

Two hundred leading scientists, including Dr. Albert Einstein, Dr. Harold C. Urey, Prof. Enrico J. Fermi, Dr. George R. Minot and Dr. Otto Meyerhof, all of whom have won Nobel prizes, and Dr. J. Robert Oppenheimer, director of the atomic bomb research laboratory, made public a statement yesterday offering to cooperate in drafting national science legislation.

JOINT BODY NAMED FOR ATOMIC BOMB

Army and Navy to Staff Board of Ten Members to Work on Further Developments

NYT 12/30

WASHINGTON, Dec. 29 (AP)—A joint Army-Navy advisory board has been created to work on the atomic bomb project with its military director, Maj. Gen. Leslie R. Groves.

Creation of the ten-man body, with equal representation for each service, aroused interest in view of the announcement earlier this month that a joint test of A-bombs would be made against warships.

Gen. Dwight D. Eisenhower, Chief of Staff for the Army, chose these members for the War Department:

Maj. Gen. Curtis E. LeMay, former commander of B-29 forces operating against Japan; Brig. Gen. William A. Borden, director of the new developments division of the department's special staff; Brig. Gen. George A. Lincoln, chief of the strategy and policy group of the operations division; Brig. Gen. Hobart Hewett of Army Ground Forces, and Col. Herbert W. Mansfield, Army Service Forces.

Admiral Chester W. Nimitz, Chief of Naval Operations, designated the following Navy members:

Vice Admiral V. H. Blandy, assistant chief of naval operations for weapons; Rear Admiral G. F. Hussey, chief of the Bureau of Ordnance; Rear Admiral G. H. Bowen, director of research and invention; Rear Admiral W. R. Purnell, assistant chief of naval operations for material; Rear Admiral H. B. Sallada, chief of the Bureau of Aeronautics.

Science Workers Back Big Three For Control of Atomic Energy

American Association Urges Support, Especially of Russia, for United Nations Educational Agency

The international relations committee of the American Association of Scientific Workers made public yesterday a statement supporting the Moscow agreement on an international commission for control of atomic energy under the Security Council of the United Nations Organization. Prof. Bart J. Bok of Harvard University is chairman of the committee.

It urged "full and immediate" support of the United Nations Educational, Scientific and Cultural Organization created in London last November, as the agency to carry on international scientific cooperation directly under the Economic and Social Council of the UNO.

Calling on all scientific organizations in this and other countries to support the UNO educational agency, the committee especially appealed to scientists in Soviet Russia, which was not represented at the London Conference, to join in this international cooperation, saying:

"The artificial and wholly unnecessary barriers which have too long prevented a thorough scientific collaboration between Soviet scientists and those of the Western nations must now be removed."

Outlines a Program

The committee proposed a program for the UNO Educational, Scientific and Cultural Organization.

"1. UNESCO should promote the exchange of scientists, young and old, on a world-wide basis.

"2. UNESCO should be charged with the responsibility of facilitating in every way the prompt interchange of scientific information. Within a few weeks after publication, reports of research published in any one country should be available everywhere in the world.

"3. UNESCO should take the leadership in the reorganization of scientific abstracting since many of the pre-war organs were traditionally in German hands.

"4. UNESCO should be an active agency to promote congresses of scientists of all nations. It should facilitate the prompt revival of the pre-war international scientific unions and assist in the formation of new unions.

"5. UNESCO should aid in the rehabilitation of scientific institutions in areas devastated by the war. A science division, with sufficient funds at its disposal, can help immeasurably in meeting the present appalling laboratory and library needs.

"6. UNESCO should give aid and advice to the growing scientific institutions in countries like China, India and some of the Latin American Republics. In these countries UNESCO can provide much needed guidance in agricultural and technical matters.

Should Make Surveys

"7. UNESCO should undertake comprehensive surveys of the scientific and technological potentialities and resources of underdeveloped regions and should issue full public reports of the results of these surveys.

"8. UNESCO should coordinate its activities with those of other international organizations with scientific and technological functions. There should be a close liaison between the science division of UNESCO and international organizations which are concerned with public health, communications, food, agriculture and fisheries, mineral resources, standards and power.

"9. UNESCO should become the principal scientific advisory body in the United Nations Organization."

The Foreign Ministers of the Union of Soviet Socialist Republics, the United Kingdom and the United States of America met in Moscow from Dec. 16 to Dec. 26, 1945, in accordance with the decision of the Crimea Conference, confirmed at the Berlin Conference, that there should be periodic consultation between them. At the meeting of the three Foreign Ministers, discussions took place on an informal and explanatory basis and agreement was reached on the following questions:

VII. The Establishment by the United Nations of a Commission for the Control of Atomic Energy

Discussion of the subject of atomic energy related to the question of the establishment of a commission by the General Assembly of the United Nations. The Ministers of Foreign Affairs of the Union of Soviet Socialist Republics, the United States of America and the United Kingdom have agreed to recommend, for the consideration of the General Assembly of the United Nations, the establishment by the United Nations of a commission to consider problems arising from the discovery of atomic energy and related matters. They have agreed to invite the other permanent members of the Security Council, France and China, together with Canada, to join with them in assuming the initiative in sponsoring the following resolution at the first session of the General Assembly of the United Nations in January, 1946:

RESOLVED by the General Assembly of the United Nations to establish a commission, with the composition and competence set out hereunder, to deal with the problems raised by the discovery of atomic energy and other related matters.

I. Establishment of the Commission.

A commission is hereby established by the General Assembly with the terms of reference set out under Section V below.

II. Relations of the Commission With the Organs of the United Nations.

A. The commission shall submit its reports and recommendations to the Security Council, and such reports and recommendations shall be made public unless the Security Council, in the interests of peace and security, otherwise directs. In the appropriate cases the Security Council should transmit these reports to the General Assembly and the members of the United Nations, as well as to the Economic and Social Council and other organs within the framework of the United Nations.

B. In view of the Security Council's primary responsibility under the Charter of the United Nations for the maintenance of international peace and security, the Security Council shall issue directions to the commission in matters affecting security. On these matters the commission shall be accountable for its work to the Security Council.

III. Composition of the Commission.

The commission shall be composed of one representative from each of those States represented on the Security Council, and Canada, when that State is not a member of the Security Council. Each representative on the commission may have such assistants as he may desire.

IV. Rules of Procedure.

The commission shall have whatever staff it may deem necessary, and shall make recommendations for its rules of procedure to the Security Council, which shall approve them as a procedural matter.

V. Terms of Reference of the Commission.

The commission shall proceed with the utmost dispatch and inquire into all phases of the problem, and make such recommendations from time to time with respect to them as it finds possible. In particular the commission shall make specific proposals:

A. For extending between all nations the exchange of basic scientific information for peaceful ends;

B. For control of atomic energy to the extent necessary to insure its use only for peaceful purposes;

C. For the elimination from national armaments of atomic weapons and of all other major weapons adaptable to mass destruction;

D. For effective safeguards by way of inspection and other means to protect complying States against the hazards of violations and evasions.

The work of the commission should proceed by separate stages, the successful completion of each of which will develop the necessary confidence of the world before the next stage is undertaken.

The commission shall not infringe upon the responsibilities of any organ of the United Nations, but should present recommendations for the consideration of those organs in the performance of their tasks under the terms of the United Nations Charter.

BY DR. HAROLD C. UREY
As told to Michael Amrine

FEDERATION OF ATOMIC SCIENTISTS
1018 Vermont St., N.W.
Washington, D.C.

TO THE EDITORS OF COLIER'S:

The scientists and engineers who developed the atomic bomb have banded together in the Federation of Atomic Scientists and are agreed on the following aims:

To study the implications to our nation and to the world of the liberation of nuclear energy.

To create a realization of the dangers that this nation and all civilization will face if the tremendous destructive potential of nuclear energy is misused.

To help establish an atmosphere of world security in which the beneficial possibilities of nuclear energy may be developed.

To study the relation between national legislation and the establishment of an adequate international policy.

Dr. Harold C. Urey, a recognized leader in science, is one of our most valued counselors in the new field of public discussion in which scientists are now participants.

The Federation, organized as the national spokesman of six local associations at bomb plant sites, with the full support of its membership, is working for control of atomic power on the world level. We believe Doctor Urey's eloquent personal plea in support of these aims deserves the thoughtful attention of every reader.

(signed)

Dr. John A. Simpson, Jr., Atomic Scientists of Chicago
Acting Chairman, Federation of Atomic Scientists

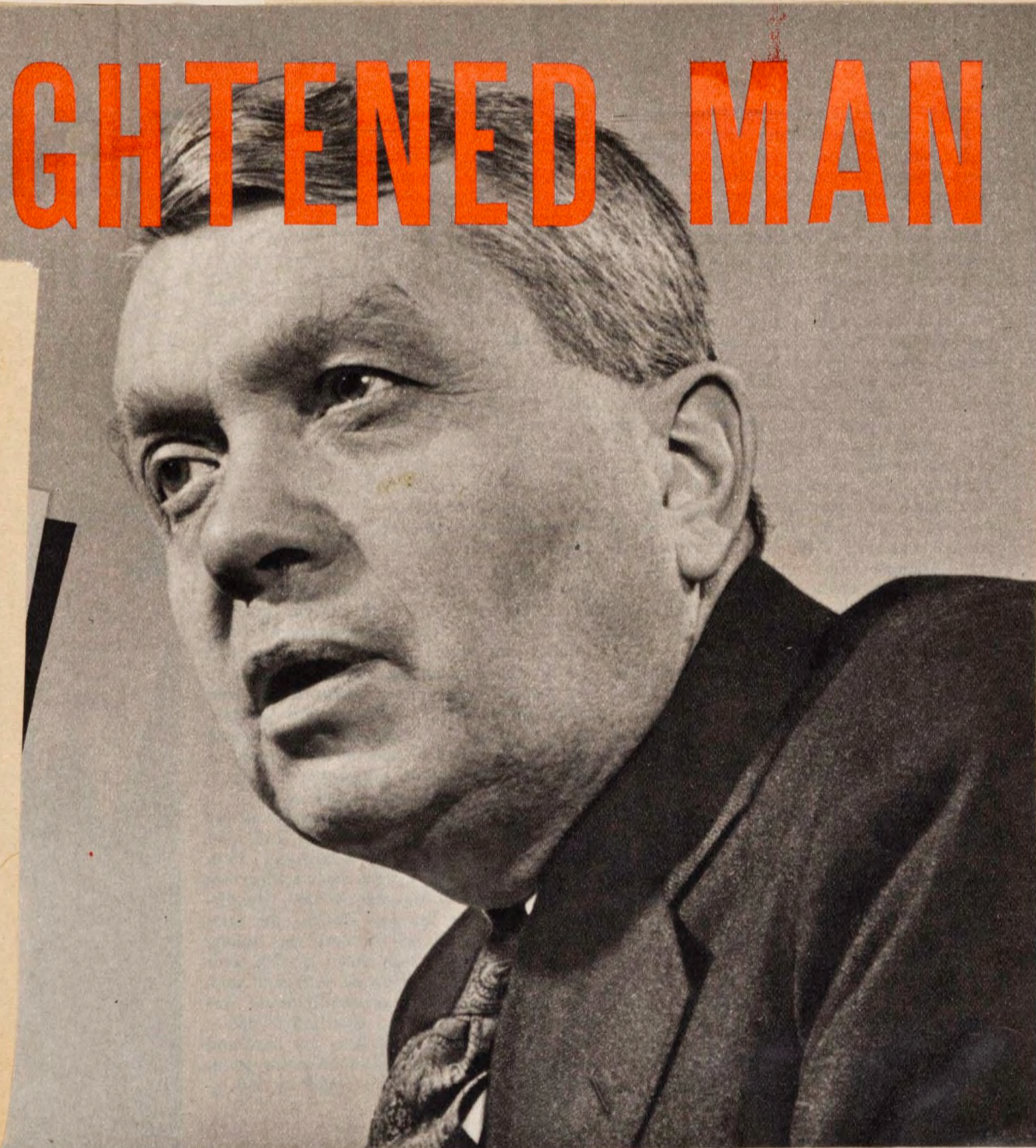
W. A. Higinbotham, Association of Los Alamos Scientists

James G. Stangby, Association of Oak Ridge Scientists

J. L. Rosenberg, Association of Manhattan Project Scientists,
New York City Area

18 I'M A

FRIGHTENED MAN



IKE VERN-PIX

Dr. Harold C. Urey is a professor of chemistry at the University of Chicago. He achieved world fame, and the Nobel prize in Science, for his discovery in 1934 of the heavy isotope of hydrogen, an important factor in nuclear energy research. Dr. Urey is probably the most social-minded American scientist, and is a former chairman of the University Federation for Democracy and Intellectual Freedom. He joined the federal atomic energy project in 1941, and has since been deeply concerned with the political-social implications of the atomic bomb. Testifying before Congress, he said that world control must be so effective that no nation can manufacture atomic bombs without instant detection and punishment

I WRITE this to frighten you. I'm a frightened man, myself. All the scientists I know are frightened—frightened for their lives—and frightened for your life.

For the past few weeks we have been in Washington giving our advice—when we are asked—concerning the potentialities of the atomic bomb. In so doing, we have naturally learned a good deal about the potentialities of politics. What we have learned has increased our fears.

I say to you—and I wish I could say it face to face—that we who have lived for years in the shadow of the atomic bomb are well acquainted with fear, and it is a fear you should share if we are intelligently to meet our problems. We were dealing with unknowns in the structure of matter. Now, in thinking about world control, mankind is dealing with new and unknown factors in the structure of international civilization. Here political leaders must pioneer as scientists have pioneered. At present they are extremely reluctant to do so, partially because they have not lived daily with this subject as atomic scientists have done for years. It is hard for anyone who did not live through it to comprehend the suspense of that atomic arms race.

As soon as it appeared that scientists would accomplish this mission, we lived in fear that Germany might capture the secret before we did. We knew enough to know this would mean the end of our countries as we loved them—the obliteration of London, Washington, New York, Detroit, or Los Alamos and Oak Ridge. That terrible fear was heightened whenever we read newspaper reports of "mysterious explosions" along the French coast, or commando raids on "research stations," which we later learned to have been V-2 laboratories.

My point is this: A few years from now, that fear may come home to you. By that time you will no longer feel so relaxed and carefree—happy that the war is over. A few years from now, you may be wondering what is going on behind the locked doors of laboratories all over the world, just as we once wondered, night and day. Then you will understand our suspense and know why we were frightened—but then it may be too late. Now, in Washington, we have

learned a new fear: We are afraid of what politicians and diplomats may do with the atomic bomb.

Perhaps you are thinking this scientist is not going to talk about science—he is going to talk about politics. He has no right to do that. What does he know about politics?

I know this: I hear people talking about the possible use of the atomic bomb in war.

As a scientist, I tell you *there must never be another war.*

As to how to avoid war, you do not want any detailed opinions on a World Government or the machinery which might be set up by the Big Three or the Security Council of the United Nations. A scientist is not fitted to do the job of the diplomats and the politicians. We are now seeing world diplomats rising to new levels of statesmanship in their understanding and leadership in atomic problems.

Technical and Political Viewpoints

But there are certain aspects of this thing which are both technical and political—for example, the question of international inspection. In addition, we scientists can speak as citizens. As citizens we are people who have had more time than the rest of you to think about the political possibilities of the bomb. We do not begin to know all the answers. But by this time, we know the questions.

Our stay in Washington has shown me that, despite all the reams of material which have been written about this, a dangerous proportion of politicians apparently does not know or understand *the questions.*

For example, they keep asking us, "Won't there be some defense against the atomic bomb?"

I have never heard—and you have never heard—any scientist say there is any scientific defense against the atomic bomb.*

In the world as we know it there is no conceivable barrier which could keep any possible plane from somehow

getting through from one country to another. Furthermore, the mere presence of the bomb cannot be detected by any "magical" means, and it is of such a size that it could fairly easily be smuggled in pieces from one country and assembled in another to await explosion at the touch of a distant radio control.

I do not know that it would even be necessary to knock out 40 or 50 cities with 40 or 50 bombs. In a country possessing excellent news communications, is it not possible that when a few cities are atomically destroyed, panic might empty the remaining cities and thus destroy the power of that country to resist?

You may say that bombing failed to reduce the will-to-resist of the British or even of the German people. But the atomic bomb is entirely different from other bombs.

Ordinary bombs do damage in a relatively small area. Relatively few persons are killed by any single bomb of the older type. If an ordinary bomb, even a block-buster, explodes in a city block, that block is horribly shattered, but unless the bomb lands near a theater or public meeting place, relatively few persons die. The bomb may kill, say, 500 persons, and wound others. Ambulances rush to the scene. Rescue crews dig through the rubble. Wounded are sped to a hospital. Survivors thank their lucky stars and continue to hope the next bomb will also miss them.

But in an atomic explosion, thousands die within a fraction of a second. In the immediate area, there is nothing left standing. There are no walls. They are vanished into dust and smoke. There are no wounded. There are not even bodies. At the center, a fire many times hotter than any fire we have known has pulverized buildings and human beings into nothingness.

The report of the U.S. Strategic Bombing Survey showed that in Germany, incendiaries did *eight times the damage done by high explosives.* A single atomic bomb has the effect not only of 20,000 tons of TNT, but in addition starts a fire of hurricane intensity. Through the blitz, London saved itself with an army of volunteer fire fighters. In the war of the future there would be precious few fire fighters

left. For the majority of wounded, there would be no hope of hospitals. The heart of a great city like London, representing centuries of human struggle and art and sacrifice, would simply vanish in a flash of fire and light. As atomic bombs are further developed, the will-to-fight will not lengthen the life of an attacked city five minutes. If such a bomb fell on London, there would be no London. There would be few Londoners.

A British scientist, Dr. M. L. Oliphant, has publicly stated that much bigger atomic bombs may soon be achieved. The Hiroshima bomb was equal to 20,000 tons of TNT. He thinks bombs of the future will be equal to a million or two million tons of TNT.

Against this the only imaginable "scientific defense" would not actually be a defense, but a retreat. I refer to the dispersion of cities. America has 200 cities with populations of more than 50,000—altogether we have a population of more than 50 million living in cities. To move them in a fantastic flight from the consequence of our evil genius would be an incredibly large project, larger even than the mass migrations of peoples of Europe since the rise of Hitler. No one can scientifically estimate such a project in terms of money—but someone has made a guess at \$250,000,000,000.

Because America is such an industrialized country, with such large populations concentrated in exposed cities, *the effect of the atomic bomb will be to weaken America's military position.* Military weakness will be measured in an interim stage not in terms of industries or navies or air power, but by the amount of urban concentration. In this interim period England's position, for example, will be all but hopeless.

An atomic arms race would soon reach a saturation point. If we are determined to make them, we can have a stock pile of 10,000 atomic bombs. So could other great powers. As soon as opposing nations have enough bombs to ruin one another's cities, you will actually have an armaments race which ends in a tie. The side which shoots first will win.

Such thinking leads scientists to say this bomb must not be used again for any purpose, not even "to enforce international justice." Suppose a small nation should begin mistreating its neighbor, in defiance of international law, treaties, or common decency. Regardless of how guilty the *rulers* of that nation might be, do you think it would be right for the great powers or an international police force to strike that nation a blow which would kill tens of thousands of innocents and cripple the culture and economy of that small nation for generations?

Intelligent men say no! Mankind's solution does not lie

in overwhelming force, any more than the safety of individual persons in a large city lies in their knowledge of jujitsu, or their ability to throw hand grenades. The safety of countries in the future, like our personal safety in cities, must rest on the *law and conscience of man*, backed by a vigilant world patrol, and the intelligent use of light arms.

Yet the scientists in Washington hear people talking of the possibility of another war. They read statements of generals and admirals which imply there could be another war. Let us do some more thinking about *that next war which must never be.*

Two outstanding things to remember about the bomb are:

1. It is much more powerful than anything previously known.
2. It could be a weapon of complete surprise—and probably will be.

Military men, who proverbially "prepare for the last war," frequently think of the bomb in terms of air power, as dropped from an airplane. It is much more apt to be used as a war head in a V-2 rocket traveling faster than sound.*

A Combination with Terrible Possibilities

As England knows, with present knowledge it is impossible to devise means of intercepting V-2s. The V-2 and the atomic bomb, militarily speaking, are made for each other—the V-2 at present cannot land on a precision point, but it can land in a general area. The atomic bomb is a weapon which needs only to go off in the general area to demolish its target.

But remember that if we continue to think of a world of force instead of law, still more likely is the use of an improved model of the atomic bomb as a mine. Some congressmen are slow to grasp this thought: such an atomic bomb exploded at Washington's Union Station would blast the marble of the Capitol into powder finer than flour.

We might not even know who had set that bomb. We might have been in a diplomatic crisis with one nation while yet another aggressor had planted the actual bomb. So we could have something new in the world, indeed—an Anonymous War. This could be the ultimate blindness brought to a world which would not open its eyes to the possibilities of a new age.

Many of us thought the possibilities would be so apparent that when humanity saw what science had done, it would see immediately that here was the end of war; that this must be the end of war forever and ever. When we went into this project we hoped that we would find and prove that it could not be done. When it seemed possible, we worked to get it before Japan or Germany. We thought the democracies would use it wisely to end the war to end all wars.

One idea was to drop the bomb on some vacant territory in Japan just to show that we had it. That might very well have ended the war. After all, Japan did surrender with an intact army, proving that it is possible to knock out a nation psychologically. I am certain one bomb would have knocked out Japan if its political leaders had been in a position to listen to the nuclear physicists. Apparently the Japanese did not listen, any more than some of our leaders have listened to America's physicists. Jap slowness of comprehension cost them dearly. At Hiroshima, men were killed. At Nagasaki they committed suicide. Further slowness of comprehension will mean further and more terrible mass suicide.

Several of us have listened to men who studied the damage at Hiroshima and Nagasaki. They confirm our belief that ending this menace—this menace to New Orleans or London or Paris—is the most important thing in the world today. As the scientists see it—and they are remarkably near unanimity—there is only one answer: *World Control*.

Slowly we are losing our original illusions. There is no secret. There is no defense. The bomb is essentially cheap—compared with the cost of other weapons and their comparative effectiveness the bomb is the cheapest war weapon in the world.

When you are talking about World Control you are, in a sense, talking politics. Most scientists, I think, prefer to view their present interest as "social awareness." It is as if a bacteriologist had discovered a dread disease which might lead to a disastrous epidemic. He would not be a "politician" if he asked that the city health commission take measures to deal with a plague. He would merely be demonstrating common decency and social awareness of what his discovery meant to human lives. So in this case the discoverers plead for a commission.

In the past, most attempts to set up an international agency for world co-operation have broken up over one main issue. Soon you will be hearing much about it: national sovereignty.

The desire for national sovereignty, the right of a nation to do as it pleases, was of course behind the "veto power" given in the Security Council of the

UNO, a veto power which in practice renders the present Council unable to cope with our problem.

It does not require a political mind to see that the idea of world control of the atomic bomb conflicts with the concept of national sovereignty.

Sovereignty to a nation is comparable to the freedom you have in the privacy of your home. Naturally nations, like individual persons, enjoy national sovereignty because it means freedom to do what they like without other nations poking their noses into their private business.

We are all glad to live in a country where no member of a Gestapo has a right to come into your front room and ask to be shown through the house. But if you knew that a certain plague was abroad in the world and a health inspector came to visit you I believe you would welcome him.

To avoid what is potentially the worst plague which ever threatened mankind, we must learn to get along with less freedom for the sake of not having our heads blown off.

For years I have been a marked man—along with hundreds of other scientists. We have been watched and controlled most carefully. If an international police and inspection force is set up it will mean still more control for all of us. But I assure you scientists will welcome these restrictions to guarantee there will never be another atomic bomb exploded anywhere. The world has

become much smaller and much more explosive.

Now we are all crowded together into a single house. Beneath the floor of our house there is a time bomb ticking away, as I write this . . . as you read this. Nations are crowded into a very small space as considered by the standards of the supersonic rocket and the atomic age. The explosion of an atomic war would smash our house of civilization—smash it beyond human comprehension. Those who even think of an atomic arms race, those who boast of battle-ships and air power, those who speak of using national force to maintain peace, simply do not understand this crowded house of fear. They do not think of what the situation may be a few years from now.

Victory to Him Who Shoots First

Picture two men facing each other with loaded machine guns. Each is afraid the other man will shoot. Each knows whoever shoots first will win. There is no doubt of that. They do not worry about technical excellence, about getting a bigger or better gun. Whoever shoots first will win.

What of national sovereignty—the national sovereignty we would not give up at San Francisco? What about freedom to do as you please?

If we have that, what can we say about Freedom from Fear?

In Washington I hear endless echoes of

old rivalries and jealousies among the Allies. There is evidence of a new nationalism based, as always, on fear. Smaller nations are enfolded by the larger powers, whether swallowed whole or merely "protected" or huddled together through fear. If you—the people—let things drift, we will perhaps see a world divided into two great spheres of interest, east and west, afraid of each other, afraid of one unguarded word. Freedom from Fear?

We will eat fear, sleep fear, live in fear, and die in fear.

*See *Tomorrow the Moon*, by G. Edward Pendray, in *Collier's* for September 22, 1945.

Because atomic energy is the basic energy of this world there is little point in seeking scientific defenses against this weapon or against its dreadful development in radioactive poisons.

We are at last face to face with the powers which, philosophically speaking, are supreme in our universe. There never will be a Maginot Line against the limitless powers of the universe as developed by the limitless imagination of Man.*

Our "defense" is Control.

First, as proposed in the Anglo-American communiqué, a free exchange of scientific information. In the case of splitting the atom, which is based on principles well known and widely discussed before the war, that does not involve giving much away. Those principles were not secret but were the common property of all free men who cared to study the world we live in.

We might fully restore scientific freedom through a world organization of scientists, with special attention to nuclear physicists.

There is one very fortunate fact in all this. You cannot become a competent nuclear physicist, able to supervise the splitting of the atom or constructing an atomic bomb plant, without a great deal of study. That study must be made in company with established physicists and use of the established instruments such as the cyclotron. You cannot become a nuclear physicist capable of real work in the field merely by studying alone in a library, any more than you can become a Jesuit without a certain number of years spent in company with Jesuit scholars. This, and the fact that scientists are among the most international-minded of men, may well be the most important factor in our survival.

Most scientists think wars and national boundaries are a menace to the true creative spirit by which science must live. They hate war and they are terrified of atomic war—because they know its possibilities.

Then recall that secrecy in this project was accomplished only by almost superhuman effort and planning. If the world were pledged to freedom and not to secrecy, the hidden production of atomic power would be difficult, indeed.

If the powers renounce atomic war and agree to international control, scientists of all nations will take that pledge seriously and will report any sudden disappearance of a number of nuclear physicists.

A New Ideal of Patriotism

As our problem is fully comprehended, I think we may hope realistically for a patriotism not to one country but to the human race, and it is that patriotism which would appear should an aggressor, through his war lords, seek to interest a group of nuclear physicists in secretly betraying an international agreement against production of atomic bombs. This, to me, is a very real hope, for I have had the privilege of knowing scientists from many countries. I know we all speak the same language. We will be bound together more strongly than ever with a common fear and a common pledge and a common hope.

Another hopeful fact is that at present the production of these bombs requires large industrial plants. It requires various substances which are comparatively rare and which an inspection force of engineers and scientists could, I think, watch with comparative ease. The sheer size of these plants, with their need for huge supplies and for specialized materials and gadgets, will help world control.

I do not believe it is beyond the ingenuity of man to establish an international commission to check these things and guarantee peace of mind to the world. We have done what seemed many times more difficult.

I have been told that the question of an inspection force, which seems to have been left "up in the air" by the Truman-Attlee-King communiqué, was purposely not decided because of technical doubts. I could understand *political* doubts based on fear of the public's reactions against foreigners and strangers roving through all the countries of the world. But most scientists, I think, believe that the *technical* difficulties of inspection are not insurmountable. I believe we will see much more discussion of technical inspection, and while the scientists discuss it I hope that mankind will continue to work toward an acceptance of the political implications.

If Russia Were in Our Position—

Now let us think about Russia. If you realize, as scientists do, that Russian science includes some of the best brains in the world today, I think you will understand, first, that Russian leaders must naturally be frightened of the possibilities of this power and, secondly, that it will not be long before they also are masters of it. As to their attitude, let us consider how we would feel if they had gotten this terrible weapon and we had not, if they were the ones who had temporarily gotten a lead which we knew we could overcome.

I can foresee an eventual meeting of the leaders of the great powers in company with their scientists. I know that scientific advisers would reflect the good faith of their leaders. Scientists will have no trouble understanding one another. When they meet I think their recommendations will be almost unanimous. I think further that they could succeed—if they are asked—in conveying this urgent message of fear—and hope.

No country knows the devastation of war better than Russia. None has lost more in men and material. Russians understood this war and they will understand atomic war. No one who understands atomic war wants anything but peace.

This is indeed The Year Atom Bomb One. It has opened most ominously. We must waste no time if we plan to be alive in A.B. 5 or A.B. 10.

We must support those of our political leaders who realize that a revolution has happened. We must listen carefully to those leaders who give us their best thought on what to do about that revolution. We must deal with those leaders who still think what was good enough in other ages must certainly be good enough for the Atomic Age. As mankind slowly comprehends, our problems will slowly become more simple. But the most fearful factor of all is time.

Years ago a modern prophet said our civilization is a race between education and catastrophe.

That "race" was once a figure of speech. Today it is *the fact of facts*.

Now, in that race between education and catastrophe, atomic power has given catastrophe a fearful lead. Atomic war could unleash forces of evil so strong no power of good could stop them. Make no mistake. Other civilizations have died because they would not learn their lessons in time. Remember that if Hitler had beaten us to this weapon—as he beat us to the V-2—America today would be a slave province in a Fascist World State. Today we are not so much in competition with other countries—humanity is in competition with itself. Think! Because we would not face the obvious, mankind allowed Fascism to blast Europe. Now if we still refuse to learn the lesson of co-operation it will be not Europe, but the world, which will lie in ruins.

What we would not learn from Hitler we must learn from Hiroshima!

Other issues wait. Other problems will stand delay. But the main race between man's powers for evil and his powers for good—that race is close to a decision. The bomb is fused. The time is short.

You must think fast. You must think straight.

THE END

*See *Deliverance or Doom*, by Philip Wylie, in *Collier's* for September 29, 1945.

Collier's for January 5, 1946

*See *Air Power in the Atomic Age*, by General Carl A. Spaatz, in *Collier's* for December 8, 1945.



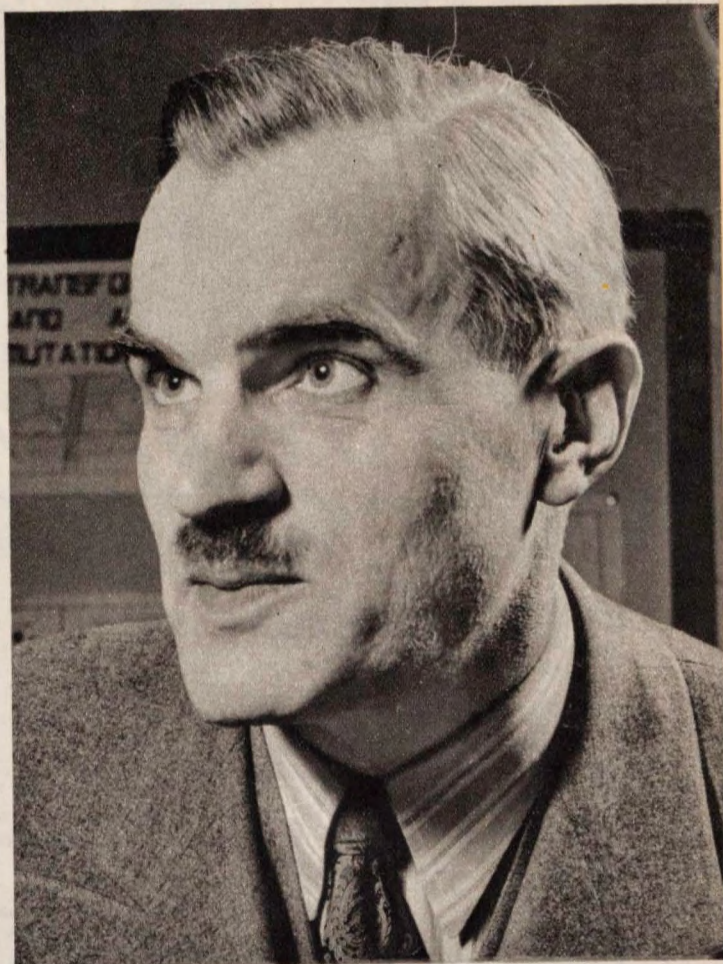
IKE VERN-PIX

Dr. Leo Szilard was a member of the National Defense Research Committee, which supervised all work in the field of atomic energy before the government took over. "The biggest secret was given away with the use of the atomic bomb," he informed congressmen. "The bomb profoundly and unfavorably affects our military position" Collier's for January 5, 1946



PRESS ASSOCIATION, INC.

Dr. J. Robert Oppenheimer, former professor of physics at California Institute of Technology, now directs the government's Los Alamos laboratory. He assembled the first atomic bomb at the test-firing site. Testifying before the Senate, he said: "There are no specific counter-measures for atomic bombs. There never will be"



ALBERT FENN-PIX

Dr. Arthur Compton was chairman of the committee appointed in 1941 to evaluate the military importance of uranium, and was in charge of fundamental studies of the chain reaction during the development of the bomb. He told Congress that control must insure that nations which have atomic bombs will never make use of them

Byrnes Unifies Delegation; Senators in Accord on Bomb

Secretary Wins Connally and Vandenberg in London—United Nations Assembly Will Be Informed of Curbs on Commission

NYT
By JAMES B. RESTON
By Cable to THE NEW YORK TIMES.

LONDON, Wednesday, Jan. 9—Secretary of State James F. Byrnes, who arrived in London last night after a fourteen-hour flight from Washington, conferred for four hours with Senators Tom Connally of Texas and Arthur H. Vandenberg of Michigan and resolved the differences in the American delegation over the United States atomic energy policy.

It is understood that Mr. Byrnes not only reassured the Senators that the United States would not give away any secrets about the atomic bomb until an effective international policy for controlling it had been reached and approved by the United States but offered to make clear to the United Nations Assembly, which meets here Thursday, that our security must be preserved at all stages.

Almost as soon as the Secretary of State arrived he invited the two Senators and their wives to dine with him in his room at Claridge's

Hotel. After dinner the Secretary and two Senators discussed the problem that has divided the delegation and astonished London for the last few days and by last midnight agreement was reached.

Senator Vandenberg had raised several questions about the resolution approved by the United States, Britain and Russia at the recent Moscow conference and placed on the agenda of the United Nations Assembly meeting under their names. The first of these was about a phrase in the resolution proposing that a United Nations Atomic Energy Commission be authorized to inquire into all phases of the [atomic energy] problem.

This phrase suggested to the senior Senator from Michigan the possibility that the commission might think it had authority to inquire into some of the secrets of the bomb which the Truman Administration had promised would be kept secret until an international policy was reached guaranteeing the right of inspection and control of all places dealing with atomic energy in all countries and at all times.

The two Senators were also known to have some doubts about whether the resolution made clear that the United States was unwilling to turn over all control of atomic energy to the Security Council of the United Nations. As a result of last night's agreement, it can be stated that the United Nations Assembly will be told that its Atomic Energy Commission will not have authority to get any information about the manufacturing processes of the bomb or any other information that is not fully protected by a foolproof international guarantee.

The urgency with which the Secretary of State got to work on this problem with the two Senators was in direct contrast to the attitude he took when he first arrived in President Truman's private plane. His attitude then was that he had heard nothing officially about any complaints by Senator Vandenberg, that he had received no protest from the Michigan Senator—though one was radioed to the State Department by the delegation officials last Saturday—and that, anyway, if there was any difficulty, he was sure that he could soon straighten it out.

The agreement will come as a pleasant surprise here when it is generally known, for the news of the split in the American delegation and Mr. Byrnes' emphasis on America's veto power Monday did not cheer up the arriving delegates, most of whom do not like to see divisions in the American ranks and definitely do not like to see the veto power mentioned by the Big Five any more than is necessary.

When the delegates of the other nations arrived here they found the London press playing up the differences within the American delegation and Mr. Byrnes' threat to use the veto on atomic bomb questions if necessary. "U. S. ready to use atom veto," The Daily Express headline read on its main story. "Atom bomb surprise for UNO meeting," shouted The Daily Herald, official organ of the British Labor party. "U. S. to safeguard own interests," announced The Daily Telegraph.

The net effect of this was to emphasize not only the fact that the American delegation was divided and uninstructed two days before the meeting but to raise again in the minds of the small powers the Big Five veto that they fought so hard to defeat at the San Francisco Conference.

As usual at these conferences, nothing is more apparent than the faith of the small nations that the United States has the power to help the United Nations develop into an effective organization based on some kind of rule of law.

Mr. Byrnes will meet with the American delegation late this morning and with the press later in the day. After that the chances are that the American delegation with its instructions will stop sparing and get down to the constructive tasks of getting the United Nations Organization off to a good start.

BYRNES PUTS END TO ATOM BOMB ROW

Issues Statement Reassuring That Congress Controls Release of Secrets

By Cable to THE NEW YORK TIMES.

LONDON, Jan. 9—United States Secretary of State James F. Byrnes put an end to the atomic bomb controversy within the United States' United Nations delegation today by announcing that no secrets of the bomb would be given away without Congressional approval.

The Soviet Union and Britain agreed with him, he said, that the proposed United Nations Atomic Commission will be governed by security regulations in all stages of its activity and that its recommendations must be ratified by the United States Congress.

If this statement still leaves any doubt in anybody's mind, he told reporters, he will repeat it in the General Assembly of the United Nations, though he seemed to emphasize that he did not think this would be necessary.

There were still a lot of doubts in lots of personal minds in London about the controversy, particularly as to how it could possibly have developed in a well-organized delegation in the first place; but at least this statement put an end to it within the delegation.

The Assembly undoubtedly will raise it again, because Mr. Byrnes' announcement that we would use our veto to protect our secrets if necessary has encouraged a movement among some of the small powers to take the Atomic Bomb Commission out of the Security Council, where the veto operates, and put it under the General Assembly. That movement is not expected to get anywhere, however, and the United States delegation is now satisfied to get the record straight and drop the whole question.

Says Four Powers Are Agreed

"There is no misunderstanding between representatives of the four governments that sponsor the [Moscow atomic bomb] resolution," the Secretary's written statement said. "They understand that the provision as to safeguards is intended to apply to all phases of any plan recommended by the commission.

"Under the language of the resolution it is obvious that the safeguards shall apply to the first stage of any plan recommended by the commission.

"Of course, any plan recommended by the commission must be submitted to the governments for ratification by them in accordance with their constitutional requirements."

As soon as Mr. Byrnes made this statement to the press Senator Arthur H. Vandenberg, who has been critical of what he believed was a tendency on the part of the Secretary to leave the vague language of the resolution unexplained, issued a statement saying that he was "completely reassured."

"I have talked with the Secretary," his statement said. "I am completely reassured upon the two points that I have deemed of paramount importance: (1) that an adequate security arrangement will always precede atomic disclosures, and (2) that any plans recommended by the Atomic Commission must receive Congressional approval in the United States. "My interest has been to make a record that avoids any possibility of international misunderstanding at home or abroad."

Vandenberg Satisfied

Senator Vandenberg added that his hope was that the delegation could now get down to work on the problems of organizing the United Nations machinery and making it work. He said that his interest had been in seeing that United States' policy was clear and fully understood not only at home but by the fifty other nations that would start the General Assembly meeting tomorrow.

And he is now confident, he concluded, that our position as stated by Mr. Byrnes, will be put on the Assembly record so that there can be no misunderstandings.

The Secretary held a long conference with the delegation this morning and went to the King's banquet tonight. He told reporters that he had no plans about the duration of his stay here, but that he wanted to stay long enough to get things well started.

Scientist in Ulster Says Russians Have Built Better Atom Bomb

By The Associated Press

LONDONDERRY, Northern Ireland, Jan. 7.—Dr. Raphael E. G. Armattoe, director of the Lomeshie Research Center for Anthropology and Human Biology, said tonight in an interview that Russia has developed an atom bomb "which renders the Anglo-American atom bomb obsolete."

He asserted that the purported Russian bomb can be manufactured on a "mass production scale." Dr. Armattoe declined to disclose the source of his information, but, pressed for a hint, replied that some members of Lomeshie Center's staff are affiliated with Russian scientific societies.

Armattoe said Russian scientists already have tested what he termed "the Russian atom bomb," which he said is about as large as a tennis ball and has a horizontal pulverization range of fifty-three miles and a vertical lift of more than six and two-tenths miles. "The

temperature generated," he said, "was in the neighborhood of several million degrees centigrade."

[A widely known New York anthropologist, who preferred to be unnamed, said that Dr. Armattoe was known to him as one "given to rather grandiose ideas." In the past, he said, he has frequently issued booklets in which he expressed unbounded admiration for Russian accomplishments. He has, the New York scientist said, no official position in any British scientific institution, the Lomeshie Research Center being his own organization. Every so often, he added, Dr. Armattoe releases "pronouncements" on some subject or another. Dr. Armattoe's last appearance in the American press was in May, when he announced from Londonderry that brunettes were smarter than blondes.]

[Dr. Victor F. Weisskopf, theoretical physicist who was intimately associated with the con-

struction of the atomic bomb in Los Alamos, N. M., commented in Cambridge that the Londonderry report sounded "like a lot of foolishness." It is absolutely impossible, he said, to derive at present as much energy from a few pounds of uranium as Dr. Armattoe suggested. In any case, he continued, Russia would necessarily proceed by making first a bomb like this country's. Such an achievement would surprise him, Dr. Weisskopf said, but in view of the fact that it is not certain how long Russia has worked on the problem, it is not to be considered impossible. German scientists, he added, could have given little help, since Germany was three years behind this country.]

Armattoe, who is thirty-three years old, was listed in the 1945 International Who's Who as a British physician and director of the Lomeshie Center. He was also listed as a fellow of the Royal Anthropological Institute, a fellow of the Society of Antiquaries and a fellow of the Linnean Society.

He described himself as a foreign member of the American Anthropological Association, a member of the American Ethnological Society affiliated with the New York Academy of Science, and a foreign member of the

American Association of Physical Anthropologists.

The scientist is a native of West Africa, who joined the Lomeshie Center staff in 1939.

The British Press Association, reporting a similar interview with Armattoe, described him as the physician in charge of the Brooke Park Emergency Hospital at Londonderry, which is in Ulster.

The British Medical Directory for 1945 listed Armattoe as a member of the British Medical Association and said he had studied at the universities of Paris and Lille.

Armattoe said that the Soviet Council of Defense had ordered a group of Russian scientists to concentrate on atomic research immediately after the Anglo-American atom bomb was first disclosed to the world.

The scientist said that the bomb was developed with the help of two German physicists whom the Russians had captured.

Russian scientists who directed the research, he said, were named "Joffe, Semyonov, Kapitza, Zeldovitch and Vilavov." He said he did not know their first names. Kapitza, he said, formerly was affiliated with Cambridge University.

Armattoe did not say where the Russian bomb had been tested, but he added that a second test will be made at the end of this month, "in a mountainous country."

"The destructive character of the Anglo-American bomb depends upon a determined size of uranium," Armattoe explained, adding: "The Russian bomb, how-

ever, develops its force by a spin or angular motion, making it more applicable for engineering work."

Russian scientists reported success in their research on Dec. 18, Armattoe added.

Armattoe said the Russians have developed a high degree of control over atomic energy in explosives and, in consequence, will be able to use it for engineering projects involving large-scale blasting.

He asserted that if Russian scientists are not already able to increase or diminish at will the range of the bomb, they "probably" will be able to do so soon.

HAHN, ATOM-SPLITTER, WAS HELD IN BRITAIN

WASHINGTON, Jan. 9 (UP)

Dr. Otto Hahn, Nobel prize-winning German scientist who laid the groundwork for the atom bomb, has been in British custody since he was kidnapped last spring by an Allied combat team in Germany, it was disclosed tonight.

Dr. Hahn is the man who first split the uranium atom and demonstrated the possibilities of "chain reaction." It was his basic idea that American scientists used in making the atomic bomb.

He "vanished" when Germany began to crumble under the Allies' blows and his whereabouts had been the subject of wide speculation. Occasionally a letter would come from him but there was never a hint where he was. The Nobel Prize committee tried to find him last November to award him its prize for his uranium-splitting work.

British sources here unfolded the true story tonight. Dr. Hahn was seized by a British-American combat team last spring and taken to England. Despite reports, he never left England after his arrest. He and about ten other German scientists have lived on a farm forty miles outside London.

There the scientists were treated as guests, were occasionally wined and dined, and were permitted even to visit London. But they were closely guarded by British soldiers and watched constantly by British intelligence.

The United Press was told that Dr. Hahn was to be returned to Germany and that, in fact, he might already be there. His transfer has been imminent for several days. Once back there, he will live in either the British or American zones and will be subject to the restrictions imposed on all Germans.

TODAY and TOMORROW

By WALTER LIPPMANN

On the Art of Secrecy

THE President in Washington and the Secretary of State in London have had to take time out to convince Mr. Vandenberg and some of the other Senators that they were not about to give away a state secret. This bit of news ought to be welcomed as showing that even in these tragic times the comic spirit has not deserted us. For surely this is the first time in history that a government ever walked to the center of the world's stage, turned all the spotlights on itself, and in the loudest possible voice promised its own representatives that it would keep a deep dark secret.

It was done, of course, in order to reassure Senator Vandenberg. But why, one wonders, did the Senator, if he is really interested in keeping a secret, arrange it so that he had to be reassured with the maximum publicity? He could quite as well have discussed his misgivings privately with Mr. Byrnes. For surely the silliest way to go about keeping a secret is to advertise it.

If we are really going in for keeping secrets, we shall have to study the art of keeping secrets. It is an art that in our fortunate past we never had to learn: we were not a military power nor a world power, and so we had no important secrets that we wished to keep. Before the war and during it we did have things that it was really important to keep secret. The most valuable of these things is not now a secret, thanks chiefly to the Pearl Harbor investigating committee, namely that we had cracked the Japanese and German codes, and were highly adept at cracking any code.

But during the war we managed to keep this secret from our enemies, and the advantage it gave us was enormous. Yet it was good luck more than our own care that the secret was kept. The Japanese intelligence was not smart enough to realize that the code was cracked even though evidence, quite sufficient to tip them off, was published in this country early in the war. That sort of luck cannot be relied upon.

But this incident is worth thinking about, particularly now that we have adopted the policy of keeping the secret of the atomic bomb. The Japanese were not smart enough to realize we had cracked their code though the essential clew had been published. Now a true system of secrecy should be one that keeps the essential clew, not from the general public, not from ordinary government officials, not from the generals and the admirals, not from a poor intelligence service like the Japanese, but from the one smart man somewhere who if he gets that clew will get the secret. The secret has to be kept not from Watson but from Sherlock Holmes, and the most elaborate precautions are useless if they do not deceive Sherlock Holmes.

I do not know how much our enemies knew about our manufacturing the atomic bomb, or how much friendly governments knew, or now know about it. But of one thing Senator Vandenberg and

others may be sure—whenever is smart enough to have penetrated our secret is smart enough not to let us realize that he has penetrated it. Foreign governments will do exactly what General Marshall tries to do about the codes: they will keep it ultra-secret that they have got the secret, or any clew to it.

Now this is just what the very people are not doing who are most concerned about the secrecy of the bomb. They have forgotten that Sherlock Holmes and not Watson is the man they have to worry about. In this field the Sherlock Holmeses are men of science, men used to detecting and weighing and reasoning from bits of evidence that ordinary men would not understand and would not notice. So the question is not whether Mr. Molotov, for example, can get the secret from Mr. Byrnes; the question is whether any scientist anywhere can smell it out.

If this scientist is working for a foreign government, he will not let us know how much he knows. He will tell his government what he needs to know, and what are the tell-tale clews that their agents should look for. It is against this man, whom we must imagine as being every bit as learned and as astute as the best men we have, that those who mean to keep the secret have to match their wits.

It is naive to suppose, as apparently Senator Vandenberg does, that secrecy depends on whether our government is willing officially to inform other governments. All governments, including our own, use secret intelligence, and it is by secret intelligence that they will in fact obtain—are no doubt in fact obtaining—their information. What is officially withheld or officially conveyed has very little, probably nothing at all, to do with whether the secret—if there is any—is kept.

Moreover, it has not much to do with whether the "inspection" we hear so much about is effective. No government really interested in atomic weapons is going to rely on the official inspectors alone. All interested governments, including our own, will keep the inspectors inspected by means of secret intelligence.

There is no possible way of telling what secret intelligence has already uncovered. Yet that is the really important secret in this whole business. The Japanese did not know we had their secret. Therefore their secrecy deceived only themselves: the more firmly they believed their code was secret, when in fact it was not, the better it was for us. For, relying upon a secrecy that did not exist, they told us everything we wanted to know.

The moral, I believe, is that we are in great danger in this business—if Senator Vandenberg in his present state of innocence is going to be a directing mind—of doing what the Japanese did, of deceiving ourselves rather than others, and of suffering all the disadvantages of basing our policies on a false and altogether amateurish estimate of what we would like the facts to be.

Butler Reviews Columbia's Role In Atom Study

In Final Annual Report to Trustees, He Traces Work Done Since 1939

The part that Columbia University played in the development of the atomic bomb since the United States began its research of nuclear fission in 1939 is reviewed by Dr. Nicholas Murray Butler in his last annual report to the trustees of Columbia University.

The report, made public yesterday by the eighty-three-year-old president emeritus, who resigned last October, described how Columbia applied her resources to the problem after Dr. Neils Bohr, of Copenhagen, arrived at Princeton Jan. 16, 1939, with news of the discoveries by Otto Hahn and Lise Meitner. Two professors in Columbia's department of physics conveyed the word to Columbia.

Physicists at Columbia, notably Professors Enrico Fermi, John R. Dunning, I. I. Rabi, George B. Pegram and Harold C. Urey devoted themselves from that moment on to the problems of nuclear fission and the release of atomic energy. They were joined by Leo Szilard and A. V. Grosse, who were "research guests" in the physics department, according to the report.

In the fall of 1939 the significance of Uranium fission was pointed out to President Roosevelt, who immediately appointed an advisory committee on uranium.

"In 1940 this committee secured from government sources funds amounting to \$6,000, most of which was allocated to Columbia for the purchase of needed apparatus and materials for this work," the report said.

"The number of persons employed upon this work rose in 1944 to more than 250 members of the scientific staff and more than 1,200 others. Many distinguished scientists from other universities and from industrial companies joined our ranks for the prosecution of this work.

Hopes for Peace Leadership

"Our Columbia scientists, under the necessities of war, did fully and thoroughly their part in the conception and production, in advance of our enemies, of a new and frightful instrument of destruction," Dr. Butler wrote. "Columbia's pride and satisfaction will be still greater if her sons and daughters, under the necessities of peace, can play as large a part in solving the still greater problems of how the world can escape the terror and ruin that misuse of atomic bombs can bring."

On the subject of the curriculum of the college, Dr. Butler cited "the movement away from the elective system to a carefully planned program based upon the fundamental principles of science, social science and the humanities."

He justified the integration of the faculties of dentistry and medicine as "the plan for strengthening dental education, research and practice" and called it "most appropriate in view of the close relationship of these two major professions dealing with public health."

Tells of Work in Radio

Discussing the university's venture into radio broadcasting, Dr. Butler said it was expected that Columbia's educational programs will reach an audience of 16,000,

000 persons, using Professor Edwin H. Armstrong's powerful transmitter at Alpine, N. J. The university's application for an FM educational broadcasting license is now before the Federal Communications Commission, Dr. Butler said.

Subjects to be treated in the broadcasts will include science, American history, international affairs, psychology, literature and languages, though Dr. Butler noted: "No courses by radio will be given academic credit, and broadcasts will not, as a rule, be made from classrooms."

For many years an exponent of international co-operation, Dr. Butler reiterated his plea in his final report: "Global warfare has made plain the fallacy of isolation, which, if followed now, would clearly lead the people of the United States to political, economic and social disaster. No one can be unaware of the vital and immediate need of international co-operation if civilization is to reach a higher plane or, indeed, is to survive."

Byrnes Address to U. N. O.

WASHINGTON, Jan. 14 (AP).—The prepared text of Secretary Byrnes's address to the United Nations Assembly as released today by the State Department:

We have met today to consider the report of the preparatory commission. This report is the result of painstaking and devoted labor by the delegates on the executive committee and the preparatory commission.

This preparatory work has made it possible for the United Nations to begin its work at the very start of the first year of peace after six successive years of devastating war and less than five months after the surrender of Japan.

For this prompt beginning, the world owes an immeasurable debt to many who are not here today. We are particularly indebted to Franklin Delano Roosevelt, Winston Churchill and Joseph Stalin.

It was they who four years ago this month at one of the darkest moments of the war joined with their allies to proclaim the United Nations declaration. Even as they exerted every effort to mobilize and unite at that late and critical moment the forces of freedom for survival, they knew that military survival, military victory was not enough.

Sought Lasting Peace

The vision of those nations, large and small, which joined in the United Nations declaration was not restricted to a wartime alliance. Their determination was to bind together in peace the free nations of the world so that never again would they find themselves isolated in the face of tyranny and aggression. Their resolve was to see that military victory was not a mere armistice to allow time for aggressor nations to choose their victims and enslave them one by one.

The purpose of these nations which united in the defense of their freedom was not to escape but to face the realities of the world in which we live. They recognized as the peace-loving nations failed to recognize after the last war that in this modern world nations, like individuals, cannot live with themselves alone.

They realized the lives and treasure which might have been saved if the free nations of the world had heeded in time the practical idealism of Woodrow Wilson, Lord Robert Cecil, Aristide Briand and Maxim Litvinov.

They realized the lives and the treasure which might have been saved if the free nations of the world had united to preserve the peace before the peace of any of them was broken instead of waiting until aggression had engulfed the whole world in flames and compelled them to unite or perish.

So the nations which were compelled to unite in a war for survival resolved even before victory was attained that they would take steps to preserve a free and a united world. They resolved to keep faith with the millions who were fighting and dying to give the world the chance which it so tragically missed after the first world war.

At Moscow, in 1943, a start was made by Mr. Hull, Mr. Molotov and Mr. Eden. On that occasion a pledge was undertaken by the United States, the United Kingdom and the Soviet Union in which China joined to work for the creation of an effective international organization. Then came the Dumbarton Oaks proposals, the Yalta decision to call the San Francisco Conference and finally the United Nations Charter which fifty-one nations joined in writing.

The charter is now part of the law of nations. It has been ratified by all the countries which are represented here. The preparatory work has been completed. The assembly of the United Nations is no longer a

plan on paper. It is a living reality—the representatives are here in this hall. The Security Council and the Economic and Social Council have been elected.

The functioning of the United Nations will depend not merely upon the words of its charter or the rules or procedures we adopt here or upon the individuals we elect to hold office. It will depend upon the support it receives from the governments and the peoples of the nations which have created it and which must sustain it.

If the United Nations lives in the minds and the hearts of our peoples, it will be able to adapt itself to the changing needs of a changing world and it will endure. If it lacks broad popular support, no charter, however perfect, will save it.

I believe the United Nations will live. I believe it because it springs from the impelling necessities of the age in which we live. It has been born out of the indescribable pain and suffering of many peoples in many lands.

It must live because in this atomic age the common interests which should unite free nations in maintaining a friendly, peaceful world far outweigh any possible conflict in interest which might divide them.

The United Nations does not threaten any people. It comes into conflict with no real or vital interest of any of its members.

It is not interest, it is fear and suspicion which in turn breed fear and suspicion that cast a shadow upon the path of peace.

As the late President Roosevelt said "we have nothing to fear but fear itself." We must dedicate ourselves to the task of exposing and eliminating blind and unreasoning fears and the unnecessary difficulties which they create.

Co-operation Can Dispel Fear

Nothing can help dispel fear and suspicion so much as co-operation in common tasks and common problems. The opportunities afforded for working together within the United Nations can help to break down habits of thinking in national isolation and go far to bring about understanding and tolerance.

The United Nations is not a mere pact among its members—it is an institution or a series of institutions capable of life and growth.

Let us use the institutions that we have created to help one another rebuild a shattered world in which there can be real security. Let us not be unduly concerned about possible shortcomings of the charter before we have even tried to operate under it.

No charter that must be acceptable to all of us can be regarded as perfect by any one of us. But it is a great tribute to the framers of the charter that it has been accepted by all the United Nations, large and small.

It is argued that the great states may abuse the rights given them under the charter. There are risks in any human undertaking. But I have confidence that the great states will respect their obligations. As President Truman stated in his opening address at the San Francisco conference:

"While these great states have a special responsibility to enforce the peace, their responsibility is based upon the obligations resting upon all states large and small not to use force in international relations except in the defense of law. The responsibility of great states is to serve and not to dominate the world."

Great states as well as small states must come to view their power as a sacred trust to be exercised not for selfish purposes but for the good of all peoples.

If the United Nations becomes

a working institution with broad popular support devoted to the development of peace, security and human well-being, whatever defects there may be in its lettered provisions will not be beyond practical remedy. Institutions that come to live in the minds and the hearts of the people somehow manage to meet every crisis.

But I offer a word of warning. Let us not expect feats of magic over night from the institutions we have created. Let us beware of the die-hard enthusiasts as well as the die-hard unbelievers. Let us not think that we can give over any and every problem to the United Nations and expect it to be solved. Let us avoid casting excessive burdens upon the institutions of the United Nations, especially in its infancy.

I recall to you the clear provisions of the charter which obligate member nations to make every effort to settle their disputes by peaceful means of their own choice before calling upon the United Nations to intervene. The primary responsibility of the United Nations is to build a lasting system of peace and security capable of meeting the stresses and strains of the future and to promote through more effective international co-operation the economic and social well-being of the peoples of the world.

In the months ahead, we must concentrate upon these tasks. We have first to provide the Security Council with the force it needs to maintain peace. This must be done by special agreements which remain to be worked out between the Security Council and the member states. We should begin upon this task immediately.

We have another task of transcending importance. The establishment of a commission to deal with the problems raised by the discovery of atomic energy is inseparably linked with the problem of security. It is a matter of primary concern to all nations. We must not fail to devise the safeguards necessary to ensure that this great discovery is used for human welfare and not for more deadly human warfare.

I hope that this assembly will approve promptly the resolution proposed by my government in association with the United Kingdom, the Soviet Union, China, France and Canada so that this commission may begin its work without delay.

The United Nations must be a co-operative effort upon the part of all peace-loving nations. Our fighting men have given us this opportunity. A great responsibility now rests upon all of us. Upon the meeting of that responsibility depends the future of civilized humanity.

Twenty-five years ago we in the United States were not fully aware of our responsibility. But with others, we have learned from experience. This time both the United States and its people are deeply conscious of their responsibility. This time on their behalf, I pledge full and wholehearted co-operation.

RUSSIAN PROGRESS ON ATOM DOUBTED

German Scientist Says Moscow Has Found No Assistance Among His Colleagues

By DREW MIDDLETON
By Wireless to THE NEW YORK TIMES.

BERLIN, Jan. 15—Russian authorities have failed to find any German physicists capable of giving them "serious" assistance in finding the secret of atomic bombs, according to Dr. Wilhelm Westphal, a leading German scientific writer and an old friend of Prof. Albert Einstein and Prof. James Frank of the University of Chicago.

According to Dr. Westphal two groups of German scientists are living in tourist hotels on the eastern shores of the Black Sea in Russia. The scientists, according to Dr. Westphal, are able men, but they are more experienced as theorists than in experimental work. He believed it "highly unlikely" that the Russians had yet produced an atomic bomb, although, he asserted, Russian scientists will produce it in a few years since the "essential facts are already known to them."

Prof. Max Steenbeck and Gustav Hertz are two of the most eminent German scientists now working for the Russians, but, according to Dr. Westphal, their work in the past has been concerned more with the cloud of electrons than with nuclear energy. Assisting these two distinguished men is Prof. Fritz Volmer, a physical chemist who had not specialized in nuclear energy until he was invited to the Soviet Union by the Red Army. Professors Volmer and Hertz went to Russia "quite willingly" when the Russians asked for their aid last June.

Dr. Westphal is quite sure that Professors Hertz, Steenbeck and Volmer "have not done anything important" since they arrived in the Soviet Union. He said that seven kilometers from their hotel another group of German scientists headed by Prof. Manfred von Ardenne had been established in another hotel with their families and assigned to the task of constructing a cyclotron, "and that is for the atomic bomb."

Professor von Ardenne is assisted by several lesser known German scientists, including Karl Bernhardt, a former assistant of Dr. Westphal. Dr. Kurt Mie, who is more famous as a scientific administrator than as an experimenter, is also with Professor von Ardenne's party.

Dr. Westphal declared that Russian scientists were not well prepared for work on atomic energy. "They had only two cyclotrons when the war started in 1941 and they have no great scientific tradition behind them," he said.

According to Dr. Westphal, all the important German physicists who had been experimenting in nuclear energy were in western Germany when the country collapsed. The chief of these, Prof. Werner Heisenberg, former director of the Kaiser Wilhelm Institute in Dahlen, was established in Wuerttemberg, while others prominent in the field were farther north in what is now the British zone.

As a result the physicists who went to the Soviet Union are not the men best acquainted with the progress of German experiments, according to Dr. Westphal. German experimentation in atomic energy had not progressed very far, he said.

"None of our cyclotrons worked and we could never get money from the Nazi Government to further our experiments," he said with a trace of bitterness. "Goering and his crowd preferred cannon."

Reds Reported Using German Atom Experts

Berliner Hears of Group at Black Sea Laboratories, Sees Bomb 'in Few Years'

BERLIN, Jan. 15 (UP).—Professor Wilhelm Westphal, sixty-three-year-old physicist and former University of Berlin faculty member, said today he had information that a group of German scientists had been established by the Russians in tourist hotels on the east coast of the Black Sea, where Russia has been setting up elaborate laboratories.

The group, head by Professor Gustav Hertz, 1925 Nobel Prize winner, has "been working in cloud electrons and knows nothing of nuclear energy, which is the most vital part of the atom," Dr. Westphal asserted. He said he doubted that the Russians had been able to produce any atomic weapon, or that they had cyclotrons which would work. "But if they don't have them now, they will have the atomic bomb in a few years," he declared.

Dr. Westphal said that all outstanding German authorities in the atom-splitting field fled to territories conquered by the Americans and the British at the time of Germany's collapse. Among the scientists understood to have been taken to Great Britain, he said, is Professor Werner Heisenberg, 1932 Nobel Prize winner, whom he described as the No. 1 atomic-energy expert of Germany.

Dr. Westphal said he was told that the Russians apparently expect the Germans to remain at the Black Sea laboratories for a long time, since they are arrang-

ing accommodations for their families. Other German scientists there, in addition to Dr. Hertz, are Professor Max Steenbeck, H. J. Vollmer and Manfred von Ardenne and Dr. Curt Mie.

According to Dr. Westphal, the Germans had no working cyclotrons at the end of the war, because "all the money went to Reich Marshal Hermann Goering's war work."

He said that although the Russians took the German experimental scientific works at Peenemuende, on the Baltic Sea, they failed to get outstanding German scientists, many of whom had been killed in the big Royal Air Force raid on Peenemuende in 1942.

Dr. Arthur H. Compton Urges Strong Defenses Against Atom

During the period in which the peoples of the world are working toward an international organization strong enough to prevent atomic war, "each nation must prepare itself to ward off or resist attack," Dr. Arthur H. Compton said yesterday.

In setting up a timetable for world adjustment to life in the atomic age, Dr. Compton, one of the leaders on the atomic bomb project and now chancellor of Washington University, St. Louis, warned that if the necessary adjustments are not made before 1970, "they will probably be too late to avert catastrophe."

Dr. Compton made these statements during a discussion of the social implications of nuclear energy at a joint meeting of 1,000 members of the American Physical Society and the American Association of Physics Teachers in McMillin Theater at Columbia University. Dr. Hans A. Bethe, of Cornell University, discussed the scientific aspects of the same subject, and Dr. James Shotwell, political scientist with the Carnegie Foundation for International Peace, the international implications.

Emphasizing that he based his opinions on the assumption that nations will work "vigorously and determinedly toward a situation in which war is virtually impossible," Dr. Compton said he did not see how a stable situation could be created in less than five years.

"My own thinking," he continued, "is based on a ten-year period ending in 1955, by which time the nations will see that their safety is better served by placing all major war powers in international hands."

In that interim, Dr. Compton foresaw no need for such "extreme measures" as dispersing American cities and placing key industries underground. However, he said he thought this country, operating on the theory that "no nation will attack us if we are known to be prepared for a reply with devastating power," could maintain that retaliatory power by using a "combination of modern military developments, including atomic bombs, without undue strain on our national economy."

Precautions against renegade

nations that might prey upon a peace-minded world, he said, require the maintenance "somewhere" of adequate police power armed with the most modern weapons, but, he added:

"Until an international organization is prepared to function in this police capacity, we ourselves must at least maintain the partial assurance of peace that our own armed strength can provide. Other nations will have to do the same."

In his discussion of the scientific aspects of nuclear energy, Dr. Bethe, who discovered the method by which the sun and stars obtain their heat from atomic energy, asserted that the atomic bomb project was a total loss as far as scientific advancement in the field of nuclear physics is concerned. That heavy atoms could be split was known twenty-five years ago, he said, but now that the atom has been split, "we have not learned anything new concerning the mystery of the nucleus of the atom: how it is held together against such explosive forces."

The fact that there are atoms which can be split is merely an accident in the time scale of the universe, Dr. Bethe continued. "The life span of the radioactive elements from which atomic energy is released is very small, compared with the life span of the universe. They are going through a process of decay and eventually none will remain. It may be merely happenstance that man existed at this particular part of the time scale of the universe before they disappeared."

Dr. Shotwell declared that the United Nations Charter, in order to control properly the use of atomic energy, should be buttressed by two additional treaties—one to implement control of armaments and the other to provide a "realistic binding covenant against war itself." In controlling armaments he proposed that the U. N. O. Security Council set up a commission of scientists, men experienced in international relations and military experts to advise the Council on methods of control.

Dr. Harvey Fletcher, of the Bell Telephone Laboratories, president of the A. P. S., presided. The annual meeting will continue through Saturday.

Plan for World Atom Control To Be Sought at Rollins College

WINTER PARK, Fla., Jan. 24 (AP).—Leading American statesmen, scientists and representatives of business, labor and education will be guests of Rollins College the week of March 11 at a conference on world government and control of atomic energy. Dr. Hamilton Holt, president of the college, announced tonight.

Supreme Court Associate Justice William O. Douglas and five Senators—Claude Pepper, Democrat, of Florida; Joseph H. Ball, Republican, of Minnesota; Charles W. Tobey, Republican, of New Hampshire; J. W. Fulbright, Democrat, of Arkansas, and Carl Hatch, Democrat, of New Mexico—have accepted invitations to attend.

Scientists who will attend include Dr. J. Robert Oppenheimer, of the California Institute of Technology, who was in charge of operations at Los Alamos, N. M., when the first atomic bomb was exploded; Dr. S. K. Allison, director of the Institute of Nuclear Studies of the University of Chicago; Dr. Harold Urey, of the University of Chicago; Dr. Lee A. DuBridge, of the Massachusetts Institute of Technology; Dr. I. I. Rabi, of Columbia University, and Dr. Henry D. Smyth, of Princeton University.

Others include Lieutenant Gen-

eral James H. Doolittle, Owen D. Young, former chairman of the board of General Electric; Charles G. Bolte, president of the American Veterans Committee; Bishop G. Bromley Oxnam, president of the Federal Council of Churches of Christ in America; Rabbi Louis L. Mann, of Chicago, and Raymond Swing, radio news analyst.

The conference has been underwritten by R. T. Miller jr., of Winter Park and Scottsville, N. Y., formerly head of the American School and the American Technical Society, of Chicago.

In making the announcement of the conference, Dr. Holt said that it would aim to agree upon and recommend development of a world government strong enough to assume effective control of the atomic bomb and super-weapons of the present and future.

Statement on Bomb Tests

From the Herald Tribune Bureau
WASHINGTON, Jan. 24.—The complete text of Vice-Admiral W. H. P. Blandy's statement to a Senate committee on the forthcoming atomic-bomb tests:

This statement is to describe the atomic-bomb tests against naval vessels to be held this spring in the Pacific. One of the most important problems in connection with these tests will be the maintenance of proper balance between public information and security. It is our hope to make available to science and to the public all appropriate information derived from this historic test.

By direction of the joint chiefs of staff and with the approval of the President, the Army and Navy and qualified civilian scientists have been joined for this purpose to form a unit which is now known as Joint Task Force 1, of which I have been named the commander. It is desired to emphasize the fact that this is a joint effort in every sense of the word. My staff includes:

Major General W. E. Kepner, deputy for aviation.

Rear Admiral W. S. Parsons, U. S. N., deputy for technical direction.

Major General A. C. McAuliffe, ground forces adviser.

Dr. R. A. Sawyer, of the Manhattan District, technical director.

Captain J. A. Snackenber, U. S. N., chief of staff.

Captain R. Brodie, U. S. N., assistant chief of staff for personnel.

Brigadier General T. J. Betts, U. S. A., assistant chief of staff for intelligence.

Captain C. H. Lyman, U. S. N., assistant chief of staff for operations.

Brigadier General D. H. Blacklock, U. S. A., assistant chief of staff for logistics.

Sea Power Is Criterion

The mission of Joint Task Force 1 is primarily to determine the efforts of the atomic bomb upon naval vessels in order to gain information of value to the national defense. The ultimate results of the tests so far as the Navy is concerned will be their translation into terms of United States sea power.

Secondary purposes are to afford training for Army Air Forces personnel in attack with the atomic bomb against ships and to determine the effect of the atomic bomb upon military installations and equipment.

The Army Air Forces, in addition to making the actual air drop, will participate actively in the operation, with regard to air transport, collection of data, observation of results and test of air force equipment. An Army Air Forces general officer, Major General W. E. Kepner, has been designated as deputy task force commander for aviation.

The Army Ground Forces will be given opportunity to test equipment, both on the target ships and ashore. A general officer of the Army Ground Forces, Major General A. C. McAuliffe, has been appointed special adviser to the task force commander for this purpose.

Total strength of personnel of the Joint Task Force will reach an aggregate of about 20,000, the naval crews of the operating and target ships constituting the majority.

First Test in May

The schedule of target dates for this operation, which will be known by the code word "CROSSROADS," now calls for the first test to be accomplished early in May, over target ships at an altitude of several hundred feet. The second test is tentatively scheduled for July 1, and will be a burst at the surface of the water among target ships.

Site of the test will be Bikini Atoll in the Marshall group. A complete description of this site and the problems in preparing for its use is now available. A list of ships to be used in the test is also available.

It will be noted that it contains German and Japanese ships as well as surplus United States naval vessels. The total number of target ships is ninety-seven and the total operating

ships in the force will number about fifty.

The target ships will be anchored and placed in a manner calculated to give effects varying from probable destruction to negligible damage among the various ships of each type. Some of the landing ships and boats will be beached. The target ships will, of course, be unmanned.

Observers will include representatives from the United States military services, members of Congress, press and United States civilian scientific groups.

The question of inviting representatives of foreign nations and foreign news services is under discussion by the joint chiefs of staff and the Secretaries of State, War and Navy.

Role of Scientists

The staff of the deputy task force commander for technical direction, Rear Admiral W. S. Parsons, who reports also to Major General Leslie R. Groves, U. S. A., of the Manhattan District, will include officers and civilian scientists experienced with the atomic bomb. In this regard Dr. N. E. Bradbury, of the Los Alamos Laboratory, is primarily concerned with the bomb itself and Colonel Stafford Warren, of the Manhattan District, is organizing radiological measurements and prescribing safety factors. So far as the tight schedule permits, use will be made of all modern scientific techniques and equipment to observe, measure and record the effects of the bomb. For example, "drone" (unmanned, radio-controlled) aircraft will be used to obtain close-up recordings of radio-activity; automatic motion-picture cameras will record the explosions visually from ingenious heavily shielded shelters on the island ring which surrounds the anchorage.

Adequate measures will be taken to insure the safety of the personnel engaged in the test, the observers, the inhabitants of near-by islands and chance travelers by sea or air.

Repair and salvage facilities will be provided to effect repairs to target ships after the first test, to make seaworthy such targets as are to be returned to the United States after the second test and to destroy such as would be hazards to navigation.

This undertaking is not a combined or international operation, but rather a scientific experiment by the United States government alone.

Furthermore, it is a test and not a contest. A test contemplated for a later period is a deep-water test in the open sea. The technical difficulties in conducting such a test will not permit its accomplishment in 1946.

Byrnes Talk on Atom Control

LONDON, Jan. 24 (AP).—The complete text of the address of Secretary of State James F. Byrnes before the United Nations Assembly today:

I wish to make a short statement in support of the very able report just made to the General Assembly by the Political and Security Committee.

The United Nations were obliged to unite in war to preserve their common freedom. The United Nations are now committed to remain united to preserve their common peace.

We won the war against aggression and tyranny by fighting together. We must now keep the peace by working together.

The report filed by the committee calls upon us to join in creating a commission to study, from the point of view of international control, the problems created by the discovery of atomic energy and of other forces capable of mass destruction.

It calls upon us to find ways which will permit and promote the use of our knowledge of the forces of nature for the benefit of mankind under safeguards which will prevent their use for destructive purposes.

Science is a monopoly of no one nation. The discovery of atomic energy, like other great scientific discoveries, is based on earlier discoveries and the research of many inquiring minds in many countries.

In a number of countries scientists were probing into the field of atomic energy before the war started. The United States, the United Kingdom and Canada decided to pool their knowledge, and the United States, at a cost of \$2,000,000,000, pressed forward with research and developments to insure that the nations fighting to preserve freedom on this earth should not lag in the race to discover the secret of the atom.

We entered this race not to destroy but to save civilization. But if the race continues uncontrolled the civilization we hoped to save may be destroyed.

The problems presented by the discovery of atomic energy and of other forces capable of mass destruction cannot be solved by any one nation. They are the common responsibility of all nations. And each of us must do our part in meeting them.

In meeting these problems we must realize that in this atomic age and in this interdependent world our common interest in preserving the race far outweighs any possible conflict in interest that might divide us.

At this first session of the General Assembly we must begin to put less emphasis on our particular viewpoints and particular interests and seek with all our hearts and all our minds

to find means of reconciling our views and our interests for the common good of all humanity.

Peace and reconciliation cannot be achieved by unilateral action. Peace and reconciliation require common action. That is why the more common tasks we set for ourselves the more likely we are to come to understand each other's problems and interests.

And certainly the problem of devising the necessary safeguards to insure that atomic energy will be used for the benefit of humanity and not for its destruction is a common problem.

To consider this and other common problems in the spirit of peace and reconciliation, we must get back to conditions of peace.

There will be need for the continuation for some time to come of armies of occupation in Germany and Japan, but it will not make for a peaceful world to have armies of occupation remain in countries which we hope will soon join us in the United Nations.

We must see that the world ceases to be an armed camp. We must see that peace treaties with the states which were brought into unwilling partnership with the Axis powers are promptly concluded and occupation forces withdrawn. We must begin to live together and to work together.

I hope that the General Assembly will promptly approve the resolution which is before it. I hope that the commission will promptly set to work on its tasks. It will be comforting to the peace-loving peoples of the world to know that we are moving promptly to endeavor to find ways to avoid a race in armaments.

We who fought together for freedom must now show that we are worthy of the freedom that we have won.

FORRESTAL URGES STRONG ATOM BODY

NYT 1/24
Navy Secretary Would Give No Power to President to Oust Commission Members

By ANTHONY LEVIERO

Special to THE NEW YORK TIMES.

WASHINGTON, Jan. 23—Secretary of the Navy James Forrestal, testifying today, advocated that no powers be given to the President to remove members of the Atomic Energy Commission, and he asked the Senate's Special Committee on Atomic Energy to include the Vice President and the Secretaries of State, War and Navy as ex-officio members of such a commission.

Stressing the need for military representation on the commission, Mr. Forrestal asserted that, unless atomic weapons were abolished in the meantime, the War and Navy Departments should share with the commission the responsibility for military application of atomic energy until 1950. Meanwhile, the Joint Chiefs of Staff would direct atomic weapon development.

Secretary of the Interior Harold Ickes, who with Secretary Forrestal supported the basic objectives of the McMahon bill for atomic energy control, asked representation for his department on the proposed commission. It was his opinion, however, that one administrator would do a more effective job than a group commission.

For Independence in Members

Mr. Forrestal's view was that the members of the commission should be on a plane with members of the United States Supreme Court and have commensurate salaries. He recommended a commission of four, appointed for six-year terms, eligible for reappointment, and removable during tenure only by impeachment. His reasons for this thesis follow:

"The prestige of the commission is established by the caliber of the members. Members serving at the pleasure of the President cannot retain the necessary independence. Therefore, the outstanding scientific and industrial leaders would probably be unwilling to serve. The bill does not provide for an executive officer or administrator. This omission goes beyond all organization experience. The separation of Manhattan District [the project which developed the atomic bomb] is logical, but these groups must be coordinated by one man."

The Administrator, Mr. Forrestal suggested, should receive \$20,000 a year and should carry out the commission's policies.

"For the period 1946 to 1950," Mr. Forrestal said, "unless the use of atomic weapons is abolished by international agreement, military applications should be a joint responsibility of the commission and the War and Navy Departments. During this period the commission and the Joint Chiefs of Staff should determine the broad lines along which atomic-weapon development is to proceed."

"I think," said Senator Johnson of Colorado, "that it is very harmful to hold out to the people that by some hocus-pocus or agreement the atomic bomb can be abolished."

Ickes Presents Argument

After saying that the tendency in Washington was to create a new department whenever a new problem arose, Secretary Ickes added:

"I content myself with saying that if the existing governmental departments that are properly concerned with international relations, military defense, natural resources, power and technology are not qualified to carry on with the problems of an atomic age, they ought to be abolished; otherwise they ought to participate, within their appropriate fields, in the control of atomic energy."

"I therefore believe it important to orderly government that there be a single administrator responsible to a committee of Cabinet officers, appointed by the President, carrying out these responsibilities set by S. 1717 [the McMahon bill] that do not fall within the jurisdiction of any single existing department."

Mr. Ickes added that if the committee deemed it essential to have wider representation there should be a board of nine members, including five or six department heads. He added the Departments of State, War, Navy and Interior should not be "shunted aside" in forming the board.

Mr. Ickes said all atomic secrets should be given to our Allies; then amended this to say it should be done after international agreement had been reached.

OAK RIDGE PLANTS CALLED 'OBSOLETE'

NYT 1/24
Dr. Dunning Reveals the Atom Bomb Factory Is Already Out of Date Technically

The extensive plants created at Oak Ridge, Tenn., for the making of the atomic bomb already have become "technically obsolete" by the development of new techniques, Dr. J. R. Dunning, director of Columbia University's division of war research and the initiator with his associates of the atomic research that led to the invention of the atomic bomb, declared yesterday.

Dr. Dunning reviewed the possibilities of atomic energy for commercial use in an address before the winter convention of the American Institute of Electrical Engineers at the Engineering Societies Building, 37 West Thirty-ninth Street. In discussing the costs of producing atomic energy, he said:

"Reduction in the cost of producing atomic fuels may come by burning U-235 in a low-level chain reaction to transform U-238, a form of uranium more than 100 times more plentiful, into another atomic fuel—plutonium. This technique, and others developed by atomic research, have already made the extensive plants at Oak Ridge technically obsolete."

Problems of Engineering

Dr. Dunning predicted that atomic power could compete commercially today with premium fuels, such as aviation gasoline, if certain engineering problems could be solved. He explained that the development of new metals capable of withstanding the intense heat generated by atomic energy and the construction of huge "atomic boilers" would be helpful toward this end.

The Columbia scientist predicted that only very large power plants,

such as those on battleships, could use atomic energy effectively. He pointed out that a shield from six to eight feet thick between the atomic boiler and the workmen would be necessary to bar the radioactive waves given off when atoms are split. The size and weight of this protective barrier would rule out the use of atomic power in homes, automobiles and airplanes of present size, he added.

"The first commercial uses of atomic energy probably will be along conventional lines to drive generators," he continued. "Later it may be possible to convert atomic energy directly into electrical energy without turbines."

Edison Medal Presented

The Edison Medal for 1945 was presented at the morning session of the convention to Philip Sporn, executive vice-president of the American Gas and Electric Service Corporation. In his acceptance Mr. Sporn said that an atomic boiler to produce a regulated flow of superheated steam "undoubtedly" could be built but that probably it had not even been designed as yet.

W. E. Wickenden, president of the institute, who presented the medal to Mr. Sporn, also briefly discussed atomic energy.

Maj. Gen. W. H. Harrison, vice president of the American Telephone and Telegraph Company, received the Hoover Medal for 1945 at the evening session. Maj. Gen. Leslie R. Groves, director of the atomic bomb project, discussed "Some Electrical, Engineering and General Aspects of the Atomic Bomb Project."

General Groves said that the atomic bomb would have been impossible without the "sublime faith" and "unflagging support" of the late President Roosevelt, former Secretary of War Henry L. Stimson and Gen. George C. Marshall. He also paid tribute to the "team work" of thousands of men and women from a large variety of professional and social backgrounds who were able to work together on the bomb project and declared this "team work" was a valuable lesson to the whole country.

Ways to Harness Atomic Energy

NYT 1/27
Harnessing atomic energy for commercial purposes will become possible with the development of new metals capable of withstanding the intense heat generated and with the building of huge "atomic boilers," Dr. J. R. Dunning, director of Columbia University's division of war research, told the American Institute of Electrical Engineers' winter convention last week. According to him, atomic power may be able to compete commercially with such premium fuels as aviation gasoline, if certain engineering problems are solved.

One pound of U-235, which will produce as much power as \$52,000 worth of aviation gasoline, probably will cost from \$10,000 to \$50,000 a pound to produce, depending on the process. Assuming a peacetime production cost of \$20,000 per pound, Dr. Dunning thinks that "some day atomic energy may be able to undercut coal as a source of energy in big power plants."

Boilers Can Be Built

An atomic boiler to produce a regulated flow of superheated steam undoubtedly can be built, although it "probably has not even been designed" yet.

Only very large power plants, such as those of battleships, can use atomic energy effectively, Dr. Dunning points out. Shielding between the atomic boiler and workmen must be six to eight feet thick to intercept the radioactive waves given off when atoms split. The size and weight of this shielding rule out use of atomic power in automobiles, homes and airplanes of present size.

The atomic boiler must be built around at least two pounds of U-235—minimum cost, \$40,000. Atomic power is produced by a chain reaction, in which the neutrons fired from one exploding atom touch off explosions in near-by atoms. In masses of U-235 smaller than two pounds too many of the neutrons fly off into space, and the chain reaction gradually dies out.

The problem of controlling this rising energy and temperature is not too serious. When the temperature goes too high the reaction slows down. Introduction of barium and cadmium control rods is very effective.

Reducing the Cost

Reduction in the cost of producing atomic fuels may come by "burning" U-235 in a low-level chain reaction to transform U-238, a common form of uranium more than 100 times more plentiful than 235, into plutonium, another atomic fuel. This technique and others developed by atomic bomb research have already made the extensive plants at Oak Ridge, Tenn., technically "obsolete," says Dr. Dunning.

The first commercial uses of atomic energy will probably be along conventional lines to drive generators. Later it may be possible to convert atomic energy directly into electrical energy without turbines. To Dr. Dunning "it is sad to consider pulling down this tremendous power to an ordinary 1,000-pound steam system." The real future of atomic energy is tied to development of metals and reflectors that can utilize high temperature.

W. K.

Navy Picks 8 U. S. Warships For Battle Fleet in Atom Test

NYT 1/24
New York, Arkansas, Pennsylvania, Nevada, Carriers Saratoga and Independence Named—Prinz Eugen Arrives in Boston

By The United Press.

WASHINGTON, Jan. 23—The battleships New York, Arkansas, Pennsylvania and Nevada will be used as "guinea pigs" in the Navy's forthcoming atomic bomb tests on warships, informed Navy sources revealed tonight.

[An article in The Chicago Sun said that the tests would start May 1 in the Pacific. The Associated Press reported.]

Other American warships to be used in the historic experiment include the aircraft carriers Saratoga and Independence and the heavy cruisers Salt Lake City and Pensacola.

The German heavy cruiser Prinz Eugen, which arrived at Boston today, and the Japanese battleship Nagato and light cruiser Sakawa also are on the "guinea pig" list.

Navy sources said that the full list of United States, German and Japanese ships to be used in the atomic tests would be announced tomorrow by Vice Admiral W. H. P. Blandy, who will be in charge of the tests. Admiral Blandy will call the roll of ships at hearings

before the Senate Committee on Atomic Energy.

Lesser vessels, including submarines, also will be used in the tests.

The Army-Navy units will be called "Task Force No. 1," with Admiral Blandy as task force commander.

The Navy rejected a request by Gov. Thomas E. Dewey that it sell the battleship New York to that State as a shrine. In rejecting the request, it was said, Secretary of Navy James V. Forrestal asked Governor Dewey to keep the reply confidential until the announced list of test ships had been made public.

The United States battleships to be used all are thirty years old or more, but distinguished themselves in World War II and some were in action in World War I.

Special to THE NEW YORK TIMES.

WASHINGTON, Jan. 23—Representative Carl Vinson, Democrat of Georgia, chairman of the House Naval Affairs Committee, has re-

minded Navy officials that under a law passed in 1882 no ship of the line could be sunk, converted to training or otherwise placed out of commission until Congress had given permission.

Germans Man Prinz Eugen

Special to THE NEW YORK TIMES.

BOSTON, Jan. 23—The German heavy cruiser Prinz Eugen arrived here today with an American skeleton crew of eight officers and eighty-five men supervising 574 Nazi officers and men.

The 19,553-ton vessel, which engaged in several actions with Allied forces in the Atlantic but escaped without serious damage, flew the United States flag as she was berthed in the South Boston Navy Yard Annex. Navy planes and bombers roared overhead.

Captain A. H. Graubart, a member of the Tripartite Naval Commission that divided German fleet units among the United States, Great Britain and the Soviet Union, reported that Capt. Hans Jurgen Reinicke, commander of the German crew, had been "very cooperative and efficient." Captain Reinicke commanded the cruiser during the last two years of the war.

Captain Graubart, former assistant naval attaché in Berlin, who was interned for five months after Pearl Harbor, said that the German sailors probably would be classified as detained enemy personnel. He said that the Navy had pledged to return them to Bremerhaven.

The American skipper pointed out that the cruiser had several un-

usual features, including damage and fire control, and carried three screws, one immediately forward to give a shorter turning circle. He said that there was more compartmentation on the vessel than in most ships and that she carried more electrically operated apparatus.

Comdr. Richard D. Harwood of Trenton, Tenn., said that the German crewmen, all of whom volunteered for the voyage, had run the ship while the Americans had acted in a more or less supervisory capacity. He described the German sailors as "just as good as our own, if anything more careful because of their intensive military training."

Germans Look for Bomb Damage

American sailors aboard the cruiser said that some German sailors had expressed surprise and disappointment that they failed to see any evidence of bomb damage they had been led to believe had been inflicted on American coastal cities. The Prinz Eugen's crew were treated to a sight of the United States battleships New Mexico and Washington, the cruiser Alaska and the carrier Randolph as the ships steamed up Boston Harbor.

The former Presidential yacht Mayflower went down the harbor to escort the prize cruiser.

Prinz Eugen Sank Hood

BOSTON, Jan. 23 (AP)—The 42,000-ton British Battleship Hood was sunk midway between Greenland and Iceland in 1941 not by the battleship Bismarck, as generally supposed, but by the cruiser Prinz Eugen, the Navy said today.

BID TO ATOM TEST TO UNO UNIT URGED

State and Navy Departments Said to Favor the Presence of Commission Members

NYT 1/26
By W. H. LAWRENCE

Special to THE NEW YORK TIMES.

WASHINGTON, Jan. 25—Well-informed quarters reported today a disposition among high-ranking State and Navy Department officials to approve proposed invitations to members of the United Nations' Atomic Energy Commission to witness the tests of atomic bombs against warships, which will be conducted at Bikini atoll in the Marshall Islands next May and July.

It was reported reliably that Dean Acheson, Under-Secretary of State, and James V. Forrestal, Secretary of the Navy, had discussed extending invitations to the powers represented on the UNO commission and it was considered probable that each nation would wish to send a representative to view the tests.

The decision is tentative and has not been announced. Mr. Acheson said at his press conference yesterday that the State Department had formulated some views on the question of inviting foreign representatives to witness the tests but that he was not yet ready to make any announcement.

It was assumed that the question would be referred to Secretary of State James F. Byrnes, who returned from London this afternoon, and to President Truman before a final decision was made.

As long as the foreign representatives are permitted only to watch the explosion of the bombs, and do not have access to the hangars on Kwajalein, where the big B-29's will be loaded with the bombs, there is no fear in military quarters that the experiment will reveal vital American secrets relating to the weapon.

It was pointed out that the Japanese, as enemies, received two opportunities to witness the explosions of the bomb, when it was used to destroy Hiroshima and Nagasaki. None of the surviving

Japanese in either city, including military personnel, had even the faintest conception of the force extracted from the universe that had been used against them.

The feeling here among administration officials is that an invitation to the UNO Atomic Energy Commission to watch the bomb go off would not, therefore, give away anything that should be held by this nation, since the tests themselves will be fully reported by newspaper and radio correspondents and filmed by motion and still picture photographers.

Under these circumstances, it was argued, unwillingness to extend the invitation would be interpreted abroad as indicative of a lack of cooperation by the United States with the world organization's effort to study and control the new weapon.

Nothing would be so conducive to world cooperation, these persons argue, than for the atomic energy policy makers to get a good look at what happened to Hiroshima and Nagasaki and what is likely to happen to the 100 floating targets against which the bomb will be directed.

Byrnes Calls Problem Knotty

WASHINGTON, Jan. 25 (U.P.)—Secretary Byrnes said that the question of inviting foreign observers to witness the atomic bomb test would require long and serious study.

Senator Brien McMahon, Democrat, of Connecticut, chairman of the special Senate Atomic Energy Committee, will meet with Mr. Byrnes to urge that representatives of the other United Nations witness the experiment. Some other members of Congress have joined in endorsing the move.

Atom Back on Page One

—Where It Should Be

By Marquis W. Childs

Washington.

1/28 - NYA
The atomic bomb is once again on the front page, and that is all to the good. There was a time when we seemed almost to have forgotten this terrible and wonderful instrument we created.

Now the Navy is to conduct a test on 35 warships and about 65 lesser craft. That test should go a long way toward answering the question of sea power in the future of warfare. If the test is set up on a fair basis and if the findings are not edited by old-line admirals with an incurable passion for battleships, then we should know a great deal more than we do now about how to spend our security budget.

The question of whether any foreign representatives will be allowed to witness the test is under discussion. To bar them would seem a foolish restriction. Surely, it should be possible to safeguard all "secrets," and yet permit foreign experts to see for themselves what the new force can actually do. If there are any doubts about its power, then a first-hand look should convince the doubters.

Meanwhile, the Senate Atomic Energy Committee, under the chairmanship of Sen. McMahon, is holding hearings on McMahon's bill to put control of the atomic energy project under a commission made up of top-ranking civilians. It is a step long overdue.

So far, the Government has left the project entirely in the hands of the military men who directed its development. In short, atomic energy has been treated as merely another weapon of war.

Opinions Changed

But it is obvious that a shift in opinion has occurred. At the time that the atomic bomb was first revealed to the world, the War Dept. sent a bill to Congress which, if it had been adopted, would have had the effect of concentrating all power in an administrator, and that administrator would in all probability have been a military man. That was the May-Johnson bill, which was sidetracked by vigorous protests from the scientists

who had helped to make the bomb.

When Secretary Forrestal testified on the McMahon bill the other day, he took an entirely different tack. He recommended merely that the military be allowed to participate with civilians on the control commission. He argued that this was necessary to insure protection of the military phases of atomic energy until world control could be worked out.

Forrestal recommended some specific changes in the McMahon bill. As written, the bill provides that the commissioners serve at the pleasure of the President. Their pay would be \$15,000 a year. The Navy Secretary urged that they be given a status comparable to that of Supreme Court Justices, with an equal salary—\$20,000 a year—and a fixed term of office, subject only to impeachment for cause.

These last may be necessary changes. Forrestal's contention that top-ranking scientists and industrialists would not serve under any other conditions has

Atomic Board Of U. N. O. May See Atoll Tests

Byrnes and Truman Back Presence of Foreigners; Results Will Be Secret

By John C. Metcalfe

WASHINGTON, Jan. 29.—The United States will invite the members of the United Nations Atomic Energy Commission to view the forthcoming atomic-bomb tests on the fleet, it was indicated today when James F. Byrnes, Secretary of State, announced that he and President Truman have approved the presence of foreign observers at the Bikini Atoll experiment in May.

Simultaneously, the House Naval Affairs Committee moved to keep the results of the test secret, when Representative Carl Vinson, Democrat, of Georgia, chairman, asked Vice-Admiral W. H. P. Blandy, the atomic-test task-force commander, to submit such legislation to the committee tomorrow.

Mr. Byrnes told a news conference at the same hour that the White House-State Department plan should not be construed as final. He explained that the question of witnesses is still being studied by Robert P. Patterson, Secretary of War, and James Forrestal, Secretary of the Navy, with General of the Army Dwight D. Eisenhower, Army chief of staff,

and Fleet Admiral Chester W. Nimitz, chief of naval operations, and their staffs.

A State Department spokesman said later in the day, however, that there is little question of the War or Navy Department overriding Mr. Truman's approval and that to all practical purposes Mr. Byrnes's remarks could be interpreted as settling the question of witnesses at the tests.

This spokesman explained that under the Truman-Byrnes plan the United States will give the United Nations commission the option of sending a committee or representatives from the governments forming that body.

If the commission decides to authorize its individual member governments to send observers, the United States will have no objection to the presence of diplomatic, military or scientific experts, or delegations including the three classifications of witnesses.

Final approval of the Truman-Byrnes recommendations would permit officials from Soviet Russia, the United Kingdom, France, China, Australia, Poland, Yugoslavia, Brazil, the Netherlands, Egypt and Canada to witness the experiment.

The department spokesman said also that the United Kingdom and Canada have already been invited to attend the tests, since they share the secret of the atomic bomb. This fact was confirmed in part earlier today when Clement Attlee, British Prime Minister, told the House of Commons of the invitation.

Stettinius May Act

It had not been determined tonight who will formally present the invitation to the commission on behalf of the United States, but it was presumed that Mr. Byrnes would take this action through Edward R. Stettinius jr., acting chairman of the American delegation at the U. N. O. meeting in London.

In his testimony before the House Naval Affairs Committee, Admiral Blandy declared the Navy plans to keep secret all technical data on damage resulting from the explosions. Only the most bare and general information will be made public, he said.

His testimony brought prompt protest from Representative Hugh DeLacy, Democrat, of Washington, who asserted such steps might have international repercussions.

"If we're going to make a show of strength that will get the whole world agitated and jittery," he

said, "we'd better take it up with the State Department."

The tests scheduled for May off Bikini Atoll in the Marshall Islands will be the detonation of an atomic bomb over nearly 100 warships. A second test will be made at sea level on a similar fleet and a third experiment is planned for 1947 with a bomb explosion one mile under the sea.

The proposed secrecy amendment was asked by Representative Vinson today after he indicated he would not rely on the Navy to keep all facts secret without a Congressional directive in the bill authorizing the sacrifice of ships for the tests.

The committee also hired Melvin J. Maas, former Representative, as its special investigator to determine the full cost of the tests. Mr. Maas has served nine terms in Congress and was once the ranking Republican member on the committee. He is a reserve colonel of the United States Marines.

Meanwhile, the Senate special committee on atomic energy, of which Senator Brien McMahon, Democrat, of Connecticut, is chairman, heard Harlow Shapley, director of Harvard University Observatories, call the Senate control measure "highly satisfactory" but suggest that debatable points be dropped to insure quick passage.

"We need at the moment," he said, "as good interim legislation as is possible. Is it not important that the controvertible points which might delay passage of the bill be avoided as much as possible?"

Mr. Shapley also urged that for one year after passage of the measure no information on atomic-bomb assembly or use be released.

In other developments of the day, Admiral Nimitz told the National Press Club he planned to attend the tests and expressed his confidence in the continued value of the Navy.

"No matter what the outcome will be of the atomic-bomb tests, we shall need the fleet until the day that our entire commerce takes to the air. That day will not come in our lifetime."

Dr. Lise Meitner, Austrian physicist, whose research is credited largely for basic development of the principles underlying the atomic bomb, arrived here last night to spend four months as a professor at Catholic University.

Rear Admiral Harold C. Bowen, head of the Navy Office of Research and Inventions, announced today that the next ten years may provide a navy radically different from the present-day type of fleet.

In the field of research, he said, there is need for studying the use of atomic energy for ship propul-

Truman Backs Non-Military Atom Control

He Concurs After Wallace Urges Civilian Board; Lucas Against Navy Test

From the Herald Tribune Bureau

WASHINGTON, Jan. 31.—President Truman and Henry A. Wallace, Secretary of Commerce, declared today that they hoped legislation would be enacted soon providing for civilian control over the future of atomic energy.

Mr. Wallace, testifying before the Senate Committee on atomic energy, urged civilian control as the best method of avoiding "any possibility of military domination or dictatorship."

Later, at his news conference, President Truman was appraised of Mr. Wallace's remark and agreed that it would be done whenever Congress fixes the necessary responsibility.

Mr. Wallace, in a long prepared statement, said: "We must insist on stimulating the development of peace-time uses of atomic energy through channels of free private enterprise—and as far as is compatible with public safety and welfare avoid stifling and restrictive governmental operation, regulation and control."

Calls Decisions Vital

He declared no one can foresee the future developments which will stem from the harnessing of the atom, and added, "we are probably standing on the threshold of a new and more far-reaching economic revolution than we have ever experienced in the past. The decisions which must be made are decisions which will determine whether mankind destroys itself or whether it finds the road to new and undreamed-of mastery of the secrets of the universe."

Mr. Wallace cautioned that legislation should prevent the growth

of private patent monopolies on critical key processes.

"We should undoubtedly give the other nations of the world reason to distrust our motives if on the international front we advocated a policy designed to prevent war and to prevent the use of atomic energy for military purposes while we simultaneously place the scientific and technical development of atomic energy in the hands of the military at home," he said.

As long as the country continues to be without legislation on this subject "we are doing just that," Mr. Wallace added. "In the eyes of the world we are entrusting all of the nation's activities in the field of atomic energy to the military."

Calls Test Unwise

Other atomic developments today included opposition by Senator Scott W. Lucas, Democrat, of Illinois, to the Navy's plan to use about 100 warships as targets for atomic bombs. He challenged the wisdom of holding such a test at all.

Congress, he said in a speech, had better "stop, look and listen, hesitate and pause" before it permits the Navy to destroy these vessels. "If we are to outlaw the use of atomic energy for military purposes," he asked, "why should we have such a display of atomic power at this time?" He suggested that the ships could better be used as salvage or even as housing for veterans in crowded port cities, such as those in New York and New Jersey.

sion, prospects for counter-measures to the bomb, cheaper and better ways of producing raw material for atomic energy and probing into the abstract-science phases of guided V-weapons and supersonic speeds for aircraft.



HELD HEARINGS ON BILLS TO PROTECT SEED PURCHASERS, IMPROVE SCHOOL LUNCHES AND SAFEGUARD FARMERS AGAINST FLUCTUATIONS IN WORLD MARKET PRICES



Industrial dispute fact-finding boards and a 30-day cooling-off period for strikes. The committee failed to act on the Fair Employment Practice bill at this session.



PEARL HARBOR RESPONSIBILITY is lengthily gone into by a congressional investigating committee which began its hearing last Oct. 26. Over objections by General Mar-

shall Congress revealed how the U. S. broke the Jap code by cryptographic machine. The hearing has not proved that any one person was responsible for Pearl Harbor.



ent for his interest in the matter and advocated that Palestine be open to all Jews. The committee also gave UNRRA an appropriation during this session.



HOUSING PROBLEM is gone into by the Senate Banking and Currency Committee, which is here listening to testimony of ex-budget director Lewis Douglas. Truman re-

cently asked Congress for housing price-control legislation. However, it voted to insert a \$191,000,000 appropriation for veterans' housing in the 1946 deficiency bill.

SCIENTISTS SCARE CONGRESS

Life, 12/31
Atomic experts put on earnest educational campaign

In the final days of its first session the 79th Congress was subjected to an unfamiliar, coldly intellectual kind of pressure. The U. S. atomic scientists, so deeply fearful of their own discovery that reporters dubbed them "The League of Frightened Men," began an intensive campaign to awe Congress into recognizing its tremendous responsibilities. They formed the Federation of Atomic Scientists, opened an ironically humble Washington office (left), adopted a program and began urging it on both legislators and public. They wanted a Big Three conference to arrange international control and sharing of atomic power, outlawing the atomic bomb and ultimate world government. Soon after F.A.S. began its crusade, a Big Three conference was called in Moscow, partly because of F.A.S. efforts.

Its earnest members take brief leaves from their atomic jobs to buttonhole (below) and lecture (opposite) in Washington. They have made a deep impression on congressmen by declaring that one bomb could level Manhattan from Wall Street to the uptown section, 10,000 could about wipe out every inch of Indiana and Illinois, that if atomic war begins the safest place will be far under the sea. They have also won over nonatomic scientists like Vannevar Bush, who previously opposed immediate sharing of the atomic secret with other countries. They now have the backing of virtually all U. S. atomic scientists.



F.A.S. HEADQUARTERS is a suite of borrowed rooms on top floor of an old, ill-treated brownstone building. F.A.S. has little money, no officers but great enthusiasm.



DR. ROBERT OPPENHEIMER (left), former head of Los Alamos bomb project, carries on congressional education campaign lunching with Senator Magnuson (Wash.).



FIVE SCIENTISTS attentively listen to a hearing of the Senate atomic energy committee. They warn: the bomb cannot remain secret, there is no defense against it.



BUTTONHOLING of congressmen is done by Dr. John Trischka. Here he calls on Senator Fulbright (Ark.) (right).



ANOTHER CALL takes Dr. Trischka to Congressman LaFollette (Ind.). Trischka, 29, worked at Los Alamos.



TWO SENATORS, Knowland (Calif.), at left, and Hart (Conn.), are next called on as Trischka continues mission.



LESSON IN NUCLEAR REACTION is given to a group of senators by three atomic scientists. At blackboard are Fontaine Armistead, physicist at Plant K-25 (left), Arthur H. Jaffey of University of Chicago group (with chalk), Dr. Trischka. Reading clockwise from left around table are Senators Saltonstall, O'Mahoney, Murdock, Tunnell,

Murray, Smith and Mitchell. The formula shows how a uranium isotope (U-238) under bombardment captures a neutron to become another isotope (variant) of uranium (U-239). It gives off a beta particle to become neptunium (Np-239) which, giving off still another particle, becomes plutonium (Pu-239), which is an atomic bomb ingredient.

THE BRITISH LOAN

IT KEEPS THE DOOR OPEN WHILE AMERICA DECIDES WHAT THE POSTWAR WORLD WILL BE LIKE

Since wars do not end in a day, the first year of peace is born amid sounds of conflict. To an American ear the noise itself is perhaps not so disturbing as a certain ambiguous tinniness at the center. Are we or are we not backing the Dutch and British gunplay in Indonesia? What are these books that General Motors won't open? What has become of our plan for Germany? What is this British loan all about?

For an example of ambiguity, the British loan is tops. Here we are offering to lend \$4,400,000,000 and the British, while accepting it, yell bloody murder. At the same time our congressmen are equally unhappy, some saying we are just underwriting British socialism while others say the loan is too niggardly to win Britain back to freer trade. The Communist leader William Z. Foster says, "American imperialism has scored a major victory," but nobody else seems to think it is a victory for anybody. Some of the best brains of both countries—notably Lord Keynes and Will Clayton—negotiated steadily for 12 weeks to produce this loan agreement. Can it really be such a disappointment all round?

The Terms

The terms of the proposed loan are in two parts. First, we advance Britain \$650,000,000 to clean up the wake of Lend-Lease. The rest of our Lend-Lease account with Britain—some \$25,000,000,000—is wisely adjudged to represent stuff the British hurled at our common foe. It is written off, forgotten, finished. Lend-Lease at least will not cloud Anglo-American relations any more.

Secondly, we advance Britain a credit of \$3,750,000,000 which she can spend anywhere she wants. This sum, added to what Britain can borrow elsewhere, will about equal her minimum need of dollars to balance her foreign-trade books over the next five years. Both loans bear 2% interest but payment of interest and amortization do not begin until 1951.

It is this interest charge that causes the yelling. From the U. S. viewpoint, the actual interest rate (since it doesn't start till 1951) works out to around 1.62%, which is less than the Treasury will probably pay for the money, so that the Treasury will be out of pocket on the deal. Moreover the interest can be waived in any year when Britain's balance of payments finds her too short of dollars. One can hear in advance the cries of injured innocence in Congress if such a year comes around.

Now look at it from the British viewpoint. They had hoped for a loan—or even a gift—that would carry no interest at all. Said the London *Economist*: "In moral terms we are the creditors; and for that we shall pay a hundred and forty million dollars a year for the rest of the 20th Century. It may be unavoidable but it is not right." Another Londoner's comment is more to the point: "It means simply that you have made us dishonest. We will become

a defaulter since we can never get enough exports to pay you back."

If this prognosis is correct, the loan would clearly be a terrible mistake. But there are certain assumptions behind current British pessimism which are not necessarily true. One is that the volume and character of world trade is going to be about the same as it was before the war. The sum of \$140,000,000 a year looks particularly large to an Englishman when he considers that Britain's prewar exports to the U. S. never earned that much. Britain's position is sad indeed if the future is to be like the past. But whose position isn't?

A Loan Is a Deferred Import

This New Year's Day is a good time to glance at the dismal era just behind us. Half a generation ago, a worldwide trend toward economic nationalism started gathering speed down the road to war. The American contribution to this trend was the Hawley-Smoot tariff of 1930, passed by a special session of Congress with the support of farmers, labor unions and businessmen, especially those engaged in producing the 650 articles of world commerce which the new tariff protected. Among the opponents of this tariff were the professional economists, 1,028 of whom signed a petition asking President Hoover to veto the bill. Said these economists, "A tariff war does not furnish good soil for the growth of world peace." Seldom has such a mouthful been spoken by so many experts to so little effect.

Within three years Britain abandoned free trade and 34 nations took to managed currencies. Up rose Adolf Hitler to offer a tempting rationalization of the new age, a division of the world into sealed trading areas. The Japanese launched their coprosperity sphere. In the U. S. a minor prophet named Cordell Hull tried to buck the trend with a device called reciprocal trade agreements. Elsewhere the economic war was on.

If Americans had known in 1930 what they have since paid so much to learn, would they have passed the Hawley-Smoot tariff? The British are inclined to assume that we would. They do not expect us to change our ways or even to learn the elementary fact that loans are deferred imports and in the end can only be repaid with goods. At this moment certain senators are trying to limit U. S. imports of British woolsens. Says London, "There you are."

The British have other troubles, too. Their productivity per manhour has been lagging behind ours for years; to compete in a free world, British industry needs modernizing throughout. Small wonder that many Britons have turned fearful and would pull the blanket of Empire over their heads. They would keep their colonial market with guns. They would hide from the dollar behind a sterling bloc. They would go their own way, the way of before the war.

It was for the precise purpose of finding an alternative to this disastrous course that Lord

Keynes came to Washington last summer. Should he have stayed home?

Part of the loan is an agreement in principle that all trade barriers should be relaxed. Details are to be worked out at an international trade conference next summer. Since the Anglo-American group dominates world trade, the possibilities of that agreement are enormous. It can reverse the trend of two decades. It can wash away restrictions on a rising tide of trading volume, and on this same tide Britain can do so much business that interest on the loan will be little burden.

The American negotiators assumed that all this will happen. It is the only possible context in which the loan makes sense. But to prove our negotiators right and the British pessimists wrong, America must look beyond the next few years of an export boom and prepare to open its own home market to a greater volume of imports than it has ever known before. We shall shortly have one more chance to become a low-tariff country, one more chance to heed the economists who denounced the Hawley-Smoot tariff. It may be our last.

Do We Learn?

There is some reason to hope that Americans do learn from experience. C.I.O. leaders have recently gone firmly on record for freer trade and more U. S. imports. Businessmen—on paper at least—are much more kindly disposed toward imports than they used to be, especially the U. S. Chamber of Commerce and the Committee for Economic Development. Even the American consumer, the first victim of protection, seems less supine than of old. Remembering that only yesterday he couldn't even get a cup of coffee, he begins to apprehend that world trade directly affects his vaunted standard of living and that imports, not gold or jobs or anything else, are the only rational object of all trade.

The British loan is not in itself the answer to anything. It merely keeps the door open while Americans decide whether they want a free, prosperous and expanding world or not. It is one of the great decisions in America's history. It will be tragic if we are not equal to it.

PICTURE OF THE WEEK: →

The three brainiest brothers in the U. S. are probably the Compton brothers. During the war it was hard for them to get together. Karl, 58, president of Massachusetts Institute of Technology, did secret scientific work in the Pacific. Arthur, 53, head of Washington University and winner of the 1927 Nobel Prize for his cosmic-ray research, worked on the atom bomb. Wilson, 55, professor and businessman, was representing the lumber industry in Washington, D. C. This month the brothers finally met. They assembled in Pullman, Wash. where Wilson was inducted as president of the State College of Washington, thus making all three college heads. They congratulated each other, played music (*opposite page*) and took stock of their college degrees. They had 46 among them.

Secrecy Hampers Atomic Research

NYT

2/3

In the course of an address which he recently delivered before the nuclear physicists of the University of Chicago, Maj. Gen. L. R. Groves made it plain that the Army intends to maintain the strictest secrecy about atomic energy. The discussion that followed left no doubt that the physicists were not pleased. Nobel Prize-winner Dr. James Franck suggested that the delineation between secret and non-secret information be left to the scientists who were working on the bomb, a suggestion reinforced by Dr. Dempster, who pointed out that scientists had kept secret the important developments of 1940.

What Is Basic Knowledge?

When the physicists asked General Groves how he distinguished basic from other knowledge he gave the astonishing reply that basic knowledge is that which is either generally known or can be easily found out—a definition which would rule out Newton's laws of gravitation, Einstein's theory of relativity, the discovery of the X-rays and much of atomic physics, including the fission of uranium by neutrons. Sticking to his guns, General Groves promised no more than to let American scientists know such facts as are openly taught abroad, thus throwing us on the mercy of European countries which are given even more than we to hugging secrets.

General Groves said that scientists at Los Alamos will be permitted to devote one-quarter of their time to what he calls free, basic research. But this permission would be considered a "part

of their salary." The inducement does not strike this department as exciting.

If the policy outlined by General Groves is indeed the one that this country will adopt the outlook for the industrial use of atomic energy is dark. Engineers, physicists, even physicians (because of the powerful radiations emitted by uranium piles) will have to work together if atomic power is to drive trolley cars, light homes and factories, heat whole cities and perform other tasks. Cooperative work can hardly be efficient if experts in one field are not permitted to learn what their colleagues in other fields have found out. If the physicists who worked on the bomb had not violated Army regulations we might not know by this time how atomic energy can be released either for war or peace.

General Groves Criticized

The Army's policy is also bound to affect branches of science other than physics. We have had an example of that in the official announcements on the successful development of bacterial warfare. Only the roughest sketch of accomplishments was presented. Yet the bacteriologists who performed their grim duty of spreading epidemics also made undisclosed discoveries of inestimable importance in controlling infectious diseases. With General Groves going so far as to advocate the muzzling of scientists who venture out of their special fields when they testify before Congressional committees, no one can predict what the effect on research will be.

W. K.

UBIQUITOUS URANIUM

2/3

The other day Dr. Harlow Shapley held up a stone before the McMahon Atomic Energy Committee in Washington and said it contained ten thousand trillion atoms of uranium-235, one material with which bombs can be charged. Within five miles of the Capitol there are about ten tons of this rare form of uranium. All the rocks contain it. They also contain far more of the commoner uranium-238, which can be converted into plutonium, another bomb material. Physicists know all this, but they have not emphasized it sufficiently when the possibility of thwarting bomb-making aggressors by an inspection system and the control of uranium traffic is discussed.

At \$35 an ounce gold is now worth \$560 an avoirdupois pound. The operating cost of producing a pound of pure uranium-235 is given by one atomic physicist, who ought to know, as \$7,200 a pound, and the cost of pure uranium-238 in metallic form as \$22 a pound. We have to multiply these figures by a factor of at least fifteen to cover investment charges and thus arrive at the actual probable cost of pure uranium-235 and 238 to the Government.

It pays in California to dig up the alluvial soil of orchards for the sake of the 5 to 50 cents' worth of gold found in each cubic yard, and the now discontinued Juneau plants in Alaska found it profitable to grind up rocks that contain no more than 87 cents' worth of gold per ton after the price of gold was raised to \$35 an ounce. Hence, even though a rocky mountain may contain less than 1 per cent of uranium the cost of grinding it up and extracting its values is not likely to deter a nation which is denied access to the rich deposits of Africa, Canada, Czechoslovakia and Utah.

All this is no reason for throwing up our hands in despair. The problem of controlling traffic in uranium is complicated. We have to decide how we can utilize uranium for power production without encouraging the production of atomic weapons, without completely throttling private enterprise by intolerable state control, and without making it utterly impossible for atomic physicists and medical men to continue their researches. The world has never been presented with a more difficult problem. To abandon all hope because uranium is everywhere is a confession of defeat. There is nothing for it but to devise some form of pact which will be buttressed by agreements for the avoidance of war and which will insure immediate action against a transgressor.

HIROSHIMA DEAD 78,150

Total Casualties in Atom Bomb Attack Are Put at 306,547

TOKYO, Feb. 2 (U.P.)—An official report from Supreme Allied Headquarters said today that the atomic bomb that burst on Hiroshima last Aug. 6 caused 306,545 casualties—including dead, missing, injured, and persons whose lives or essential wants were directly affected by the explosion. The report put deaths at 78,150. It said 13,983 persons still were

listed as missing, 7,031 men and 6,952 women.

The blast caused 9,428 serious injuries; another 27,997 men and women suffered minor injuries.

The major category of the list was that covering "general sufferers." These totaled 176,987 persons who suffered from sickness or lack of homes, food or clothing after the bombing. NYT 2/3

Text of Truman Letter on Atom Bill

NYT 213
WASHINGTON, Feb. 2 (AP)—Following is the text of President Truman's letter to Senator Bren Mahon, Democrat, of Connecticut on atomic energy:

You have requested my views on S. 1717, a bill for the domestic development and control of atomic energy. I wish to give you my thoughts at this time because I consider the subject of paramount importance and urgency, both from the standpoint of our welfare at home and that of achieving a durable peace throughout the world.

I appreciate the thorough and impartial manner in which atomic energy hearings have been held before your committee. I believe that the hearings, in keeping with democratic tradition, have aided the people in obtaining a clearer insight into the problems which such legislation must meet.

You will recall that I sent a special message to the Congress on Oct. 3, 1945, calling for legislation to fix a policy for the domestic control of atomic energy. Since then I have given considerable time to the further study of this most difficult subject. I have had the advantage of additional technical information and expressions of public opinion developed at the hearings. With this background I feel prepared to recommend in greater detail than before what I believe to be the essential elements of sound atomic energy legislation:

(1) A commission established by the Congress for the control of atomic energy should be composed exclusively of civilians. This should not be interpreted to disqualify former military personnel from membership, and is in accord with established American principles embodied in our statutes since 1870. I would prefer a three-man commission in lieu of a larger group, which administrative experience has shown unwieldy. It is essential that the members of the commission be full-time Government employees.

(2) The Government must be the exclusive owner and producer of fissionable materials. (Fissionable materials are, of course, to be distinguished from source materials from which fissionable materials may be derived. By fissionable materials, I mean such as U-235, or plutonium, or any substance enriched in these beyond its natural state.) It follows that there should be no private patents in this field of exclusive Government activity.

The disadvantage of Government monopoly are small compared to the danger of permitting anyone other than the Government to own or produce these crucial substances, the use of which affects the safety of the entire nation. The benefits of atomic energy are the heritage of the people: they should be distributed as widely as possible.

(3) Consistent with these principles it is essential that devices utilizing atomic energy be made fully available for private development through compulsory, non-exclusive licensing of private patents, and regulation of royalty fees to insure their reasonableness. These provisions will assure widespread distribution of the benefits of atomic energy while preserving the royalty incentive to maintain the interest of private enterprise.

(4) In my message of October

3, I wrote: "Our science and industry owe their strength to the spirit of free inquiry and the spirit of free enterprise that characterize our country."

(This) is our best guaranty of maintaining the preeminence in science and industry upon which our national well-being depends."

Legislation in this field must assure genuine freedom to conduct independent research and must guarantee that controls over the dissemination of information will not stifle scientific progress.

Atomic energy legislation should also insure coordination between the research activities of the commission and those of the proposed National Science Foundation, now under consideration by the Congress.

(5) Each of the foregoing provisions for domestic control of atomic energy will contribute

materially to the achievement of a safe, effective international arrangement making possible the ultimate use of atomic energy for exclusively peaceful and humanitarian ends. The commission should be in a position to carry out at once any international agreements relating to inspection, control of the production of fissionable materials, dissemination of information, and similar areas of international action.

I feel that it is a matter of urgency that sound domestic legislation on atomic energy be enacted with utmost speed. Domestic and international issues of the first importance wait upon this action.

To your committee, pioneers in legislation of vast promise for our people and all people, there beckons a place of honor in history.

Sincerely,

HARRY S. TRUMAN.

Navy-Air Forces Rivalry Is Seen Jeopardizing Atomic Bomb Test

Indications Arise That Each Faction May Seek Not to Find Out the Truth but to Defend Its Own Theories; Mitchell Dispute of '20s Recalled

By Joseph and Stewart Alsop

WASHINGTON, Feb. 10.—Since there are so many other causes for disquiet at the moment, it seems too bad to add another to the list. But it must be recorded that the outlook for an impartial, definitive test of the atomic bomb is much less hopeful than most people have been led to suppose.

The ancient demon of inter-service rivalry has reared its head, there are already indications that instead of a serious attempt to determine the strategic implications of the bomb, the test may deteriorate into another grim struggle between Navy and Army Air Forces. The danger is that each faction will seek, not to find out the truth, but to defend its own theories at all costs.

Inter-service rivalry has afflicted the atomic-bomb test from the start. In the subcommittee of the Joint Chiefs of Staff, which did the preliminary planning, the initial struggle was for control of the test. The Navy viewpoint was that since the major purpose of the test was to decide the effect of the bomb on naval power the problem was a naval problem. Therefore full naval control was demanded. This the Air Forces resisted, and after a long debate conduct of the test by a joint task force was agreed upon.

There was a further struggle over the command of the joint task force, which the subcommittee compromised by reporting to the Joint Chiefs of Staff that the Navy, the Air Forces and the Manhattan District project (as originator of the atomic weapon), all had primary interests in the test. The Joint Chiefs, with Admiral Leahy and the chief of naval operations acting together, chose a naval commander, the able Admiral Blandy. He is now energetically organizing the joint task force.

One Bomb, One Ship

The trouble is not at an end, however. The impression has been created, largely by foolish publicity, that the object of the test is to drop a bomb which will either destroy or render unusable the

majority of the scores of ships which will be anchored in Bikini atoll. Rightly or wrongly, this is widely blamed upon the Navy, both among the atomic experts in the Manhattan District, and among the chief men of the Air Force. The inference is therefore being drawn that an attempt is on foot to discredit the test in advance.

The actual object of the test is much less dramatic. As the rules are interpreted by the Air Forces and Manhattan District officers, the object is to determine whether one correctly aimed atomic bomb, exploded in the air, at water level, or under water, can destroy one battleship. Correct aiming is defined, in the case of the bomb to be exploded at water level, as an explosion "within 400 feet" of the primary target. According to the Manhattan District and air force men, the test will be successful if one bomb destroys one battleship. The other vessels involved in the test are intended to determine the possible additional range of destructive power of the bomb, and to decide such other vital questions as the range of the bomb's radio-active effects. These would not destroy a naval vessel, but might either kill its crew or force abandonment of the vessel by the crew.

Counting the Cost

Again, according to the Air Forces and Manhattan District people, the test will require revisions of present conceptions of naval strategy and tactics if it is shown that the threat of attack by an atomic bomb can force a fleet or task force to disperse very widely. When widely dispersed, the naval craft cannot defend one another with supporting fire against hostile aircraft. Great battleships and carriers are too costly and important to be sent to sea, if, in emergency, they are

Laski Would Destroy U.S. Atom Bomb Store

LONDON, Feb. 10 (UP).—Professor Harold J. Laski, chairman of the British Labor Party Executive Committee, said tonight he had never heard, in modern civilization, of an action like that of the United States in excluding foreign scientists from its atomic-bomb factories, "except in the service of power politics."

Laski called for destruction of existing stockpiles of atom bombs and pooling of the secrets of atomic energy.

to be deprived of the supporting fire needed to defend them.

Such are the arguments. The arguments themselves are much less important, however, than the fact that the sharpest mutual suspicion has already arisen between the services in connection with the test. It will, of course, be denied at the Navy Department. But both at the Air Forces and at the Manhattan District is assumed as a matter of course that because official naval concepts have been questioned, evaluation of the results of the test will be neither calm nor impartial.

This fact, again, is only important because it indicates the completeness of the services' failure to attempt a calm, definitive assessment of the strategic implications of the new weapons, and their resulting failure to evolve a revised, over-all American defense program. It is true that separate, unco-ordinated Army and Navy programs have been submitted, with the approval of the Joint Chiefs of Staff. But it is much more significant that President Truman has twice requested a joint, over-all plan, the Joint Chiefs have reported to him that they could not agree on this problem. No agreement is hoped for by most of those responsible for advising the President in this connection.

There have been tests before. There were the Mitchell tests, which ended in a squabble about rules. There was the hitherto secret test of the bombing of the battleship Iwowa, in 1937, when the effects of the heavy hits scored by attacking aircraft and the fairness of the test as a whole were once more disputed by the Navy. The lesson of both tests was ignored. It would be tragic if that pattern were to be permitted to repeat itself. We cannot afford to repeat quite all the errors of the '20s and '30s.

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Science: Atomic Bomb Tests Will Not Set Fire to Ocean

Earth Will Not Be Destroyed by Chain Reaction, but
Explosion Is Likely to Split Water Into Oxygen
and Hydrogen, Which Will Reunite in New Blast

By John J. O'Neill

What will happen when an atomic bomb is dropped into the ocean, as is planned in the coming test in the Pacific? Anything is possible, but only certain occurrences are probable.

Since a number of repetitions of the test are planned it can be stated—unofficially, since the plans are shrouded with military secrecy, but with a great deal of certainty—that there is no likelihood that the bombers will blow up the earth by setting the ocean afire in an atomic conflagration of its elements.

There should, however, be many interesting situations developing the instant the bomb explodes under water, and immediately afterward, as these events unfold, some strange activities of great magnitude in the air and in the water. As a spectacle it will be far more magnificent than that which accompanied the dropping of bombs on Japan. Water will provide a much more energetic response than solid ground or thin air, but this livelier response of water may result in obscuring the fantastic panorama in a cloud of steam.

Ocean Will Not Ignite

First comes the non-existent danger of igniting the ocean. The ocean consists largely of water, two-thirds of its atoms being of hydrogen and a third oxygen. Dissolved in the water are quantities of the salts of sodium, magnesium, potassium, calcium and other elements. None of these elements, if smashed, gives off more than 1.5 per cent as much energy as an exploding plutonium atom, so they will be a practically negligible factor. The plutonium blast does not give off a high enough potential of energy to smash the hydrogen atom. There is, therefore, no reason to fear the test will "ignite" the ocean.

The physical effects of the bomb explosion under water will be the most interesting and spectacular. Observers, however, may see only a mass of brilliantly illuminated fog which may hide an inner core of incandescent water—water reduced to its constituent atoms. The ocean will boil. The ocean, or at least a large mass of it, will shoot skyward, in addition to the vast clouds of steam. A man-made cloudburst will follow. The waters will rage. A vast circular wave, shaped like one of the lofty crater rings on the moon, will build up around the explosion, perhaps hundreds of feet from it, subside and build up again a number of times, and lesser giant waves will rush outward from it.

When the bomb explodes after penetrating to the determined depth beneath the surface there will be a fiery blast just like the ones that took place when the ex-

perimental bomb was exploded in New Mexico and its two successors were exploded over Japan. The surrounding water will add certainty to the explosion and probably increase the efficiency of the bomb, because all of the explosive plutonium in the bomb will be set off in the first phase of the detonation. When the bomb was set off in air some of the neutrons from the exploding atoms which were depended on to produce the chain reaction escaped into the air. When the bomb is dropped into the ocean the surrounding water will reflect the neutrons back into the plutonium, adding side links to the chain reaction.

Out of the mass of exploding plutonium will come fragments of atoms moving at velocities of upward of 10,000 miles a second, and high-energy radiation, super X-rays, with strong disintegrating powers. Events are likely to take place at such a rapid pace that the water may not be able to respond as a normal liquid to the super-speed forces imposed on it and may exhibit new properties as a solid just as air exhibits some characteristics of a solid when a body seeks to move through it at a speed greater than the velocity of sound.

Will Break Water Molecules

The flying fragments from the plutonium blast will strike the molecules of water and will change them not to steam but to a higher energy state—break them up into their constituent atoms, two of hydrogen and one of oxygen. Some of the super X-rays striking the oxygen atom may smash it and knock out of it four or five hydrogen atoms and perhaps a lithium atom, which in turn may be struck by a flying fragment and further reduced to two helium atoms, which may fly about and damage other atoms.

Just the outward pressure of the radiation and the plutonium fragments will act to create a cavity in the ocean around the point of the explosion. All around this cavity the water of the ocean will be reduced to atoms, and some of its atoms smashed, changing the liquid to a gaseous state that will be created so quickly that it will press with tremendous pressure against the surrounding water.

The water immediately above the explosion will respond with the least counter-pressure and the explosion will blast a hole through the top of the ocean and into the air. Up through this chimney will

rush a mass of incandescent hydrogen formed from the disintegration of water and its oxygen. It will glow with a deep red glare as it shoots upward into the atmosphere.

Second Blast From Hydrogen

When this hydrogen column has cooled sufficiently, which may take place in the flick of an eyelid, it will unite explosively with the oxygen of the surrounding air and a second blast will take place. The glow of the hydrogen and the flash of its explosion is likely to be hidden in the greater blinding brilliance of the highly incandescent material shot upward from the cavity around the plutonium explosion.

It is possible that this incandescent material may get into the air a small fraction of a second before a vast cloud of steam surrounds it and mushrooms upward to a great height. The ultimate effect of the major percentage of the energy released in the plutonium explosion will be the production of steam.

Practically all of the energy released from the explosion, either as flying fragment or as radiation, will contribute to transmitting to the surrounding waters of the ocean a tremendous mechanical blow which will be transmitted outward as a shock wave.

It is to study the effect of this shock wave that the bomb experiment is being made. Water transmits compressional waves, sound waves being of this type, at a velocity of about 5,000 feet a second, or five times faster than air. This

may mean a five times greater effective destruction area in water than in air. Water is almost incompressible so it should make an excellent transmitter of any force impressed on it.

Steel transmits these vibrations with more than three times the velocity of water. This may give a clue to what will happen to a ship when the shock wave from the explosion transmitted through the water strikes it. Figures are not available as to the intensity of the pressure wave in pounds a square inch that will move outward from the bomb explosion and impinge on the hulls of ships in near-by water.

Pressure Will Be Great

Pressures produced by the explosion will be vastly greater than those existing in explosions of ordinary chemical bombs, yet "near misses" by these latter bombs were effective in crushing sections of hulls and opening seams in ships. The effective pressures in these cases were limited to a very few square feet.

The pressure wave from the atomic bomb explosion will be exerted on the entire hull and it may be of sufficient intensity to crush the entire hull of a warship as flat as a squeezed out tube of toothpaste so that it will sink like a chunk of iron. This will certainly happen if the ship is close enough to the explosion. The principal problem to be solved by the test is determining the critical distance at which this crushing will take place for the various types of ships. This will require

that many ships be placed at various distances.

If a ship is within a few hundred feet of the explosion there is a good chance that it will be blown completely out of the water, along with a large section of the ocean. The intense heat may have little effect on the metal. Perhaps a thin surface skim of the metal may be melted and blown away as happens with meteorites. The pressure wave may be destructive to smaller and less strongly built merchant vessels to a distance of several miles from the explosion.

The explosion may blow a hole in the ocean a mile in diameter, the size depending on the amount of plutonium used in the bomb. Most of this water will be converted to steam and that steam will expand to cover a very large area around the explosion and will reach high in the air. It will shortly afterward be transferred into a downpour of rain.

Ocean to Leap Skyward

When the surrounding water rushes in to fill the vast hole, the floods from all sides will meet in the center and will shoot upward into the air an enormous column of water as if an ocean volcano were erupting into the atmosphere. It will rise like a towering fountain, hundreds, perhaps thousands of feet high, and will then collapse back into the ocean producing an outward surge seeking to reproduce the original hole.

At a certain distance from the center the outward moving water will be met by the still inward surging waters and there will rise up at this distance a great circular wall of water which will rise to perhaps a tenth of the height reached by the central column. This, too, will collapse with both an inward and outward surge. As the inward surge from all directions meets again at the center another water column will rise, but this second fountain may be only a quarter as high, or less, than the first one.

The action that will take place will be the well known phenomenon that is observed when a drop of fluid falls from a height into a deep pan of that liquid but the scale will be gigantically enlarged. Ships caught in these gigantic waves may fare badly.

CONGRESS AND THE BOMB ^{2/10}

Three bills dealing with the atomic bomb have been introduced in Congress respectively by Senators McMahon, Johnson and Ball. All three stipulate that there must be national control of atomic energy, especially of fissionable material, and some control of patents that disclose how such materials may be used. Of the three bills that of Senator McMahon is most likely to satisfy the scientists and to obtain the approval of Congress. It is also the one endorsed by President Truman in his recent message.

Both the McMahon bill and the President's message stress free enterprise. Yet both find themselves forced to lay down principles of control which are incompatible with free competition and free research. Under the bill all private patents on production processes must be sold to the Government, or compulsory licenses at reasonable royalty rates must be granted for the utilization of fissionable material—a principle which the President endorses but which marks a departure from our traditional patent policy. Though there is to be free dissemination of information on atomic energy, the scientist who has something to communicate must abide by the Espionage Act, which means that he is at least indirectly subject to military control.

Scientists, sociologists, authorities on international relations and Congressmen have all done their best to find some solution of the problem presented by the atomic bomb and at the same time to preserve freedom of competition, freedom of research and freedom of publication. No one has succeeded. Some formula must be found which, though it cannot be perfect, will at least make it possible to proceed at once against an aggressor who is known to have atomic bombs and whose attitude is such that he is likely to use them in achieving his ends with a few swift blows. Such a formula of necessity restricts Governments, industrial corporations and scientists. We cannot have free enterprise in a field which includes not only uranium but anything associated with it in utilizing atomic energy for peace. It is the price that we have to pay if we want to avoid another catastrophic global war.

U. S. and Soviet Physicists Plan To Get Together.

Letters Reveal First Step Toward an Exchange of Students, Professors, Ideas

^{2/15} By Stephen White ^{HT}

An exchange of letters between official representatives of American and Soviet physicists, in which the first tentative steps were taken toward an exchange of students, professors and technical information between the two countries, was revealed yesterday.

The Soviet letter was signed by Professor Jacob Frenkel, of the Leningrad Physico Technical Institute, a former colleague of Niels Bohr, who helped develop the atomic bomb. It was couched in warm terms of friendship, and was answered equally warmly yesterday by Dr. Edward U. Condon, president of the American Physical Society and director of the Bureau of Standards.

In his letter, Professor Frenkel itemized the scientific matters that the Russians plan to study, including "especially nuclear physics." "We shall be happy," he wrote, "to exchange our ideas with our American colleagues, not only by sending reprints of our published works, but also by discussing various topics 'in statu nascendi' (freely, 'as they are born') at international conferences and private meetings both in this country and America."

The complete texts of the letters:

From Professor Frankel

Jan. 4, 1946.

"American Physical Society,
New York City.

"I gladly take this opportunity for sending heartiest New Year greetings to my friends and colleagues in America on behalf of Soviet physicists, and myself in particular. I wish that we could begin in 1946 to collect the fruits of our common victory over the destructive forces of Nazism and Fascism and develop our constructive activities for the benefit of humanity in a spirit of mutual understanding and sympathy, and in closer contact than before the war.

"One of our main tasks will consist in accelerating the training of students in physics to make up for the heavy losses in the ranks of young scientists suffered during the war. We shall further turn again to problems of fundamental research in the physics of matter—solid and liquid bodies including highpolymeric substances, electrical properties of dielectrics and semiconductors, and other subjects where such research had been started before the war, especially nuclear physics; there will also be a further increase of activity in the study of various physical processes—acoustical, optical, radio, etc. A group of Russian theoretical physicists to which I belong will tackle problems both of a fundamental kind, like the theory of nuclear forces, relativistic quantum theory of complex particles, the principles of statistical theory and of more special character referring to properties of matter and kinetics of various processes taking place in material bodies, and to geophysical and astrophysical applications of general theory.

"We shall be happy to exchange our ideas with our American colleagues, not only by sending reprints of our published works, but also by discussing various topics 'in statu nascendi' at international conferences and private meetings both in this country and America.

"We hope that the spirit of hostility and distrust which has lead to misuses of scientific discoveries for destructive purposes will gradually subside and that Russian and American scientists will be able to co-operate in their common efforts to improve human life."
"J. FRENKEL,
Leningrad Physico Technical Institute."

Dr. Condon's Reply

"Dr. J. E. Frenkel, Leningrad Physico-Technical Institute, Leningrad, U. S. S. R.

"On behalf of the American Physical Society, allow me to send to the physicists of Soviet Russia greetings and best wishes in response to your cable, which I had the honor of reading to our members at our annual meeting in New York in January.

"We shall not forget the heroism and sacrifices of the Russian people in the fight against our Fascist enemies. It is our earnest desire to extend the basis of complete scientific co-operation between your physicists and ours. We hope to develop on a much greater scale than before the exchange of reprints and correspondence, of students and professors leading to joint exploration of natural laws for peaceful and constructive purposes.

"We recognize that secrecy practices which were established during the war represent a perversion of the true spirit of science. We are therefore working to bring about rapidly the publication of basic scientific researches carried on during the last five years.

"Owing to disturbances of the war we have been receiving your publications on a very irregular basis and suppose that this has also been true with regard to your receipt of ours.

"We would welcome suggestions as to the best way of arranging for completing the sets of periodicals in our libraries. With friendly greetings to all Russian physicists and friends,

"Sincerely,

"E. U. CONDON,

"President, American Physical Society, National Bureau of Standards, Washington."

Patterson Says Military Must Keep Its Bombs

Warns Senators Against Putting Atomic Energy Solely in Civilian Hands

HT By Jack Tait 2/15

WASHINGTON, Feb. 14.—Robert P. Patterson, Secretary of War, demanded today that present stocks of atomic bombs "remain in the hands of the military forces."

Appearing before the Senate Atomic Energy Committee, holding hearings on atomic energy control legislation, Mr. Patterson said under questioning that "I do not think the military significance of atomic energy has entirely passed." He told the committee in a statement that the bombs should not be removed from the "nation's arsenal" except in the event "of disarmament of atomic bombs by effective international arrangement."

Mr. Patterson insisted that the Army and Navy be given a voice in any form of control machinery established by Congress. Any other policy, he said, "is taking the greatest risks with the safety of the nation."

Mr. Patterson said the Army and Navy would be "utter strangers to what was going on" if Congress adopted the McMahon atomic control bill in its present form. He had been called to testify before the committee on the bill, introduced by Senator Brien McMahon, Democrat, of Connecticut, chairman of the committee. "The War Department cannot subscribe to these provisions (in the bill) which virtually exclude the armed services from all phases of military application of atomic energy. Under the bill the commission would have sole responsibility for all further research and development in the military field."

Mr. Patterson agreed that atomic energy control should be placed in the hands of a civilian commission or agency, but said some provision must be made to give the military a voice in aspects of control peculiar to the Army and Navy. He spoke in favor of the controversial May-Johnson bill for atomic control, approved with amendments by a House committee, but added that the War Department now was advocating changes in the bill suggested by President Truman.

Frank B. Jewett, president of the National Academy of Sciences, another witness, told the committee: "The (control) board should be wholly or predominantly civilian. If wholly civilian, it should have suitable liaison representatives from the military services. If partially military, I think such membership should be limited to a single representative from each service."

Meanwhile it was reported that the Navy will rush repairs on target ships used in the first atomic-bomb tests to ready them for the second experiment.

Crack salvage crews, under Commodore Will A. Sullivan, it was said, will carry on twenty major repair operations simultaneously at Bikini Atoll and thereby make it unnecessary to bring the damaged ships back to Pearl Harbor to prepare them for the second test. Commodore Sullivan played an important part in readying for use the demolition-wrecked harbors in Africa and Europe during World War II.

tests, the first on May 15, the second July 1.

Mr. Forrestal said that the third test, an underwater explosion, to be held some time next year, would "give us more useful information" than the first two, which will explode bombs above and on the water's surface.

In reply to a question from Senator David I. Walsh, Democrat, of Massachusetts, chairman of the committee, Mr. Forrestal said he believed the Navy already had power to conduct the tests without Congressional approval, although he welcomed the latter. He said the Navy had not declared all the target vessels in the atomic-bomb tests obsolete, but that it had been decided their use as such was more essential now than for any other purpose.

Mr. Forrestal said it was important to get "speedy action" on the size of the Navy now because many "competent officers" are leaving the service due to lack of a definite program.

Cites Maritime Position

Mr. Forrestal warned Congress that America was a maritime nation, that "attacks upon us or by us must cross on, over or under the sea." Therefore, he said, "whether peace comes to depend primarily on international cooperation or whether we must rely principally on our own strength—in either event, we shall need a Navy to discharge its traditional mission: control of the seas and of the skies above them."

Fleet Admiral Chester W. Nimitz, chief of naval operations, testified: "There is no doubt that the use of atomic explosives and other new weapons will have a profound effect on the composition and employment of armies, navies and air forces in the future. The problem which now confronts us is to provide fighting forces for the condi-

tions which exist today and at the same time to determine and accomplish in an orderly manner the degree and direction of the changes necessary to adapt our fighting forces to changing conditions."

Admiral Nimitz said that with adequate bases and the Navy's carrier fleet it would be "very difficult" for an enemy to launch an air-borne atomic attack on this country.

Ships "Unprofitable Targets"

Ships are vulnerable to attack with atomic explosives, he conceded, but they are "difficult and unprofitable targets for atomic bombing because of the degree to which they are dispersed in naval tactical dispositions and because they are mobile."

He said the submarine, which is "relatively immune to atomic bombing and radar detection," may become the "most successful vehicle for carrying atomic weapons to within short distances of coastal targets."

Admiral Nimitz, like Mr. Forrestal, warned against depleting the Navy at this time.

At this point, Senator Peter G. Gerry, Democrat, of Rhode Island, reminded both Mr. Forrestal and Admiral Nimitz that President Truman's latest budget provided for a Navy of only 300,000 men and 30,000 officers and protested that the committee ought not to be a "rubber stamp" for the Navy.

Mr. Forrestal, with some heat, replied: "In the present state of the world I cannot say too strongly that if this country goes back to bed, we don't deserve to survive." Chairman Walsh added: "If this committee cuts down on the Navy's request, and we get into a war a year from now, this committee will bear the responsibility."

Senator Leverett Saltonstall, Republican, of Massachusetts, asked whether President Truman's attitude on this matter was known by the Navy. Mr. Forrestal replied that "in general terms he is desirous of whatever naval force we need. However, he has not com-

mitted himself to any precise size."

Senator Gerry also inquired as to the cost of maintaining the recommended Navy establishment. It was given as about \$5,073,000,000, of which \$3,525,000,000 was slated for upkeep, \$1,300,000,000 to complete the shipbuilding program and \$248,000,000 for ordnance.

Vice-Admiral Forrest P. Sherman, deputy chief of naval operations, told of the many bases needed to assure adequate defense. He revealed, incidentally, that a delegation of Australians was en route here to discuss the future of the base at Manus in the Admiralty Islands. The United States Navy during the war maintained a huge base there. Other major bases will be in Honolulu, Guam, Saipan and the Philippines. The Ryukyus in southern Japan will be a secondary base.

Bases in the Atlantic

Atlantic bases will be at Argentina, Newfoundland, on the Great Circle route; Bermuda, Great Exuma, Jamaica, Antigua, Saint Lucia, Trinidad and British Guiana. They include those obtained from the British in the destroyer deal, plus others needed to cover the defenses of the Panama Canal. Many other bases would be "extremely valuable," Admiral Sherman pointed out, but "are not practicable within the personnel ceiling established by the bill under consideration."

Here Admiral Nimitz declared that with these bases and the post-war fleet maintained along recommended lines, only one foreign power—Great Britain—would have a fleet "strong enough to contest seriously our command of the sea areas vital to us."

Atomic Bomb's Power Debated Before Hearing

DeSeversky and Gen. Farrell Disagree on Destruction If Loosed on New York

By Raymond J. Blair ^{2/16}
 WASHINGTON, Feb. 15.—Major Alexander P. De Seversky declared today that little material damage would result from the explosion above a fleet of an atomic bomb like that dropped on Hiroshima or like the one which wrecked Nagasaki.

The flyer and writer on air power also told the special Senate Committee on Atomic Energy that if dropped on New York or Chicago, one of these bombs would have done no more damage than a ten-ton blockbuster. He contended that the results at Hiroshima and Nagasaki could have been achieved by about 200 B-29 bombers loaded with incendiaries, although, he said, fewer Japanese would have been killed.

His testimony touched off a debate by a group of atomic bomb experts over the potency of the new weapon and its effect if dropped in downtown New York. Brigadier General Thomas F. Farrell, chief engineer of New York State, who headed atomic bomb operations in the Marianas, replied that an atom bomb dropped on New York and exploded on the ground would do from 120 to 140 times the damage that a blockbuster could cause.

"No one would say that one atom bomb would destroy New York," General Farrell said, "but I wouldn't want to say what eight bombs would do to New York, or three to Washington. Those cities wouldn't be going concerns."

Major De Seversky had asserted that an atomic bomb exploded over New York, Pittsburgh or Detroit merely would break windows over a wide area.

Major De Seversky, who studied bomb damage in Europe and Asia as special consultant to Robert P. Patterson, Secretary of War, read the committee a statement labeled, "Atomic Bomb Hysteria." It cautioned against exaggerating the potency of the atomic bomb, and was similar to arguments he presented in a recent magazine article.

Commenting on the writer's comparison of the block-buster and the atomic bomb, Senator Thomas C. Hart, Republican, of Connecticut, former commander of the Asiatic Fleet, noted: "I rather fear that you were combating one over-statement with one of your own."

"Well, if I've equalized it, I'm happy," Major De Seversky said.

Colonel Stafford Warren, chief of the medical section of the Manhattan Engineering District, which developed the A-bomb, testified that radiation from the Hiroshima and Nagasaki explosions caused an increase of only 5 to 7 per cent in casualties above what would have resulted from the explosion itself and resultant fires. He said atomic radioactivity has been exaggerated, noting that he saw in the two ruined cities twenty cases of fire burns to one of gamma-ray burns.

Senator Edwin C. Johnson, Democrat, of Colorado, brought out that the atomic bomb to be used in the Navy's Pacific tests this summer would be of the improved type dropped on Nagasaki.

Major De Seversky stated that if either this or the Hiroshima-type bomb were exploded over the fleet, he didn't think very much material damage would result. "As for radioactivity, I'll leave that to the experts," he added. "As to explosion underwater (also contemplated in the tests) that's open to all kinds of speculation."

He noted that a direct hit from

Witness at Atom Hearing



Associated Press wirephoto
 Major Alexander P. de Seversky testifying yesterday before the Senate atomic energy committee

any type of bomb, atomic or otherwise, would destroy a battleship.

Relating his inspection of Hiroshima, he said: "I had heard about buildings instantly consumed by unprecedented heat. Yet here I saw the buildings structurally intact, and, what is more, topped by undamaged flag poles, lightning rods, painted railings, air-raid precaution sirens and other comparatively fragile objects." He concluded that damage there and at Nagasaki was similar to that caused by previous B-29 raids.

General Farrell said Major De Seversky would have been more accurate had he said 500 B-29s could have done the damage caused by one atom-bomb-carrying B-29 at Hiroshima and Nagasaki. He noted that these 500 planes would have required 5,000 crew men, instead of the ten or eleven actually used.

Plain Speaking

By Francis E. McMahon

47P 2/16

There is grave danger that the McMahon bill for the control of nuclear energy will be defeated unless it receives stronger public support. Taking advantage of general apathy concerning the bill, its opponents are wasting no time. Recently the National Assn. of Manufacturers issued a blast against it (the NAM does not yet know the atomic age has arrived). It is likely the bill will be emasculated unless enough people wake up.

The McMahon measure has received the indorsement of the Federation of Atomic Scientists, an organization including the great majority of the scientists who have worked on the atomic bomb. These men have more than an interest in technical problems. They are men with an aroused social and political conscience. They know what atomic energy means in terms of destructiveness, and they are as concerned as no other group today with the need for rapid enactment of legislation for the control of the new force.

The measure they have indorsed strikes a happy medium between excessive governmental restrictions and uncontrolled private exploitation. It was drafted with a view to insuring at once national security and full encouragement of research and development, and because national security in the last analysis is unthinkable without world security the bill expressly calls for a program of administration "which will be consistent with international agreements made by the United States."

An outstanding feature of the McMahon bill is its emphasis on civilian control. All members of the five-man commission must be civilians. The commission would work in close liaison with the military, but it alone would be charged with the responsibility of policy making.

The commission must have in mind not only national defense but also international accords. It must concern itself both with atom bombs and with peacetime uses of atomic energy. It must not only marshal scientists for emergencies, but also provide the best possible conditions for atomic research.

Here is a job definitely for the civilian minded.

What is happening right now in the field of nuclear research in this country demonstrates the need for immediate legislation of this character. Research at present is supervised by the Army under conditions which scientists are finding intolerable. As a result, research projects are rapidly disintegrating.

Topflight scientific personnel at the various centers (Los Alamos, Chicago, Oak Ridge, and Hanford, Wash.) are withdrawing in large numbers. The scientists find they cannot work fruitfully under the controls now in force. In the meantime, nuclear research is probably being pushed at a feverish pace in all other parts of the industrial world.

Science cannot long thrive in the atmosphere of secrecy. The advance of science, especially during the past 50 years, is due largely to the free exchange of information among scientists. But secrecy is still the watchword in this country. Our scientific research is already suffering because of it.

The McMahon bill would sweep away the cobwebs of unnecessary secrecy. Its whole stress is upon the fullest possible freedom for the scientists consistent with national safety. It would allow dissemination of basic information. It would encourage, moreover, independent research by granting funds and equitably allotting vital materials.

The bill has wisely provided for periodic public scrutiny of the work of the commission in charge. Quarterly reports would have to be submitted to the President and to the Congress, listing in detail the activities of the commission and outlining the program for the future. This frequent checkup would prevent any abuse of extraordinary powers.

Like nuclear science itself, legislation about nuclear energy is in its pioneering stages. No one knows all the answers. But the McMahon bill is an intelligent start. It should be approved as quickly as possible.

Congress must be told that delay is inexcusable.

More Canadians Rounded Up As King Implicates Russians

Former Arms Minister Denies Atomic Bomb Secrets Were Involved in Leaks—Influx of Soviet Emissaries Noted Recently

NYT

By P. J. PHILIP

Special to THE NEW YORK TIMES.

OTTAWA, Feb. 16—The rounding up for detention and interrogation of persons suspected of having communicated secret and confidential information either directly or indirectly to members of the staff of a foreign mission here is still proceeding not only in Ottawa, but in several other centers. [President Truman was informed in November of the investigation, the White House said.]

The suspects will be brought to Ottawa for interrogation by the two Supreme Court judges, Robert Taschereau and R. L. Kellock and their counsel who have been appointed as Royal Commissioners to investigate the whole affair.

While it is taken as at least probable that the information divulged concerned the use of atomic energy, that is not certain, and last evening Minister of Supply and Reconstruction Clarence D. Howe, who was formerly Munitions Minister, declared that such was not the case.

It was pointed out that the secret of the details of the manufacture of the atomic bomb had never been known to anyone in this country, and that the Canadian military, political and scientific authorities had always taken the attitude that they would rather not know them.

[A United Press report said that authoritative sources had suggested that radar was the most likely objective of those seeking data as it had been developed for defense against possible air attack from the Arctic.]

It is understood that when Prime Minister W. L. Mackenzie King issued his statement on the case last evening he sent copies not only to the press, but to all the eighteen embassies and diplomatic missions in Ottawa, and in a covering note to the Soviet Embassy, indicated that members of its staff were involved.

Both Ambassador George N.

Zaroubin and the military attaché, Nikolai Zabolin, are absent from Ottawa. The latter is believed to have returned to Moscow some weeks ago.

There also have been considerable changes in the staff and services of the Soviet Embassy recently and it is believed that all those who may have been implicated in the disclosure of secret information have been recalled to Moscow.

In the official list of diplomatic representatives and consuls compiled by the Department of External Affairs here from information supplied by the missions, the Soviet staff is given as composed of thirteen members, all married, but it is understood that the total number of Soviet representatives in this country is between eighty and ninety.

The United States Embassy has a listed staff of twenty members and the United Kingdom High Commissioner's office has seven.

[Saturday The Canadian Press quoted "an unimpeachable source" as having said that evidence gathered by counter-espionage squads had disclosed that Russia gradually was building a large spy service in Canada, The Associated Press reported.]

Although the news of the "leak" was not divulged until yesterday, the investigation has been going on quietly for several weeks. What made publicity necessary was that it had advanced to the point where it was necessary to detain those known or suspected to have been implicated.

These persons have not been arrested, but merely detained for interrogation under the National Emergency Powers Act passed by order-in-council. It is understood that already several have been released after interrogation.

Some Detained in Homes

Others are still detained in the custody of the Royal Canadian Mounted Police or, in some cases, confined incommunicado in their homes.

As Mr. King announced in his statement, all those involved, or nearly all, either are employed or had been employed in a number of departments and agencies of the Government.

From what little can be gath-

ered, it appears that photostatic copies of important documents are known to have been made and secretly circulated, but in most cases the charges are only of having repeated to "unauthorized persons" information of a confidential kind. The phrasing used in his statement yesterday by Mr. King that some of those who have been detained had been far more deeply involved than others who were "more or less innocent instruments" is interpreted as indicating that in only a few, if any, cases is it likely to be proved that information was actually sold.

The implication is rather that the whole leakage was due either to political sympathy or carelessness.

During the war there were repeated instances of such indiscretion, which gave serious concern to the security departments of other nations. For the most part they arose out of inexperience in the necessity for secrecy and any information that was passed around at cocktail parties and bridge games did not get any farther.

Until the investigation by the Royal Commissioners has been completed the case remains sub judice here and no information is being given either by any of the services involved.

It has been learned that work on a contract with the Soviet authorities for Diesel engines by a concern in Vancouver has been ordered suspended.

Truman Told in Advance

Special to THE NEW YORK TIMES.

WASHINGTON, Feb. 16—President Truman was fully informed in advance of the Canadian investigation of leaks of allegedly secret and confidential information in Ottawa, the White House said this afternoon.

Revealing that the suspects had been held after months of investigation, Charles G. Ross, Presidential press secretary, said that Prime Minister King of Canada had talked about it last November when he and Prime Minister Attlee of the United Kingdom conferred here with Mr. Truman over the control of atomic energy.

In denying a published report that Mr. King had made a secret visit here to discuss the situation with Mr. Truman, Mr. Ross stated that the President had not seen the Canadian Prime Minister since that meeting.

"But the President has been kept fully informed more recently through the State Department," he added.

Mr. Ross made this authorization after he had conferred

with Mr. Truman upon the President's return in mid-afternoon from an over-night cruise on the Potomac River on the Presidential yacht Williamsburg.

The President declined to say more than this, Mr. Ross declared. All that the State Department would say was "we did have knowledge of the whole matter."

Rumors of espionage activity in Canada and the United States were called to the attention of James F. Byrnes, Secretary of State, at a press conference Feb. 8, but he dismissed them briefly.

"Has this Government in recent months received any report, oral or otherwise, from Canadian authorities regarding espionage activities carried on in the United States and Canada by agents of a foreign power?" a reporter asked him.

Mr. Byrnes replied that if Canada or any foreign Government should advise this country of espionage activity he would not comment on it. He added that if any other Government gave this country information regarding espionage activity in this country he would turn it over for investigation, whether or not it was correct. He declared that he would not comment on such a report because if he did it might help the fellows who were guilty to escape the punishment they deserved.

RANKIN TRAILS 'RING'

Says 'Communist Spies' Are Being Sought in United States

SANTA FE, N. M., Feb. 16 (AP)—Maj. Gen. Patrick J. Hurley asserted today that it was known aboard before the end of the war that there had been a leakage of atomic energy secrets to the Soviet Union.

WASHINGTON, Feb. 16 (UP)—Representative John Rankin, Democrat, of Mississippi, said tonight that a "Communist spy ring" had been uncovered in Canada that "extends throughout the United States and is working through various Communist front organizations."

Mr. Rankin, a member of the House Committee on Un-American Activities, said the committee was "on the trail" of the Communist spies.

Canadian Case Criticized

By Wireless to THE NEW YORK TIMES.

LONDON, Feb. 17—Professor J. D. Bernal, one of Britain's most eminent physicists, said today at the conference on Science and the Welfare of Mankind that the espionage conspiracy uncovered in Canada was a direct result of reluctance to share atomic secrets and scientific information generally.

L. J. Solley, Labor member of Parliament who has assisted in British atomic research, said that the Canadian investigation was a threat to scientific progress.

In testifying before the Senate Committee on Atomic Energy, A. C. Klein, who had much to do with the construction of the plant at Oak Ridge, Tenn., stated that since one pound of uranium-235 is equivalent in terms of energy to 1,500 pounds of coal, 300 tons would give as much power as a million tons of coal. Similar comparisons have been made before by competent physicists, so that there is no reason to doubt their accuracy.

Yet engineers will ask for more detailed figures before they are likely to engage in research in the hope of substituting uranium for coal. Mr. Klein no doubt made allowance for the fact that uranium-235 is not completely transformed into energy either in a "chain-reacting" pile or in a bomb. In addition, we have to consider the investment cost of large amounts of pure graphite and of steel and concrete structures to shield workers from deadly radiations. Lastly, there is the fact that the fuel cost of any power plant is far less than the cost of distributing electric current—not more than 17 per cent. So little is known, because of military secrecy, about the conditions under which a chain-reacting pile operates, that engineers hardly know where uranium stands in competition with ordinary fuels.

On the basis of the known fact that not more than 0.1 per cent of the total energy in an atom of uranium-235 is released, Dr. Leonard I. Katzin of the Los Alamos Laboratory months ago compiled some figures that support Mr. Klein's optimism. Even if uranium-235 is not consumed efficiently, it can compete at \$7,500 a pound with coal at \$5 a ton and with fuel oil at three cents a gallon. What pure uranium-235 actually costs, no one knows outside of the accounting departments of Oak Ridge and Hanford, so that even Dr. Katzin is working in the dark.

No social revolution is in sight. Our turbines, electric motors, street cars, vacuum-cleaners, electric lights, toasters and percolators will remain as they are, so that to the manufacturing company and the householder the world will not be changed in the slightest. It is in backward countries that have no fuel where a transformation of folkways may be expected. Brazil, for example, has large deposits of thorium (from which energy can be obtained about as readily as from uranium), of manganese and of iron, but no important deposits of coal. Only lack of money can prevent Brazil from developing her Garys and Pittsburghs. Other countries may be in a similar position.

It is not impossible, then, that metals may be more widely produced than at present, with economic consequences difficult to forecast. Coal and oil may yet cease to be bones of economic contention, and uranium deposits may be coveted instead. It will probably be impossible to prevent the secret production of atomic bombs despite all the measures that UNO may adopt, but if UNO is given complete control of uranium mining and traffic, and if uranium does indeed become an important "fuel," international disputes of the kind that

have followed the discovery of oil in the Near East may cease to trouble industrial Powers.

Byrnes Denies Atom Spy Ring Got U. S. Secret

Concern in Capital Mounts, However; F.B.I. Hunting Tie With Canadian Affair

HT By James G. Simonds 2/20

WASHINGTON, Feb. 19.—James F. Byrnes, Secretary of State, declared today that as far as he knew the secret "know-how" of the atom bomb was still the exclusive property of the United States and that the spy ring discovered in Canada had not extended its operations southward into the United States.

Mr. Byrnes said he was not aware that a single American or even any person in the United States was involved in the case. Moreover, he said at a press conference, he knew of no arrests contemplated by the Department of Justice in connection with the espionage ring.

Even this statement by Mr. Byrnes did little to allay mounting concern in government circles throughout the capital over the implications of the Canadian plot, which has been attributed to Russian agents. In other high government quarters, a conviction was expressed that a spy net of at least equal size and character was operating in the United States.

These sources felt that perhaps an effort was being made to tone down the import and ramifications of the espionage threat, and that it might finally develop that there was a spy net operating in this country which had links to United States government departments.

At the same time, it was learned that the Federal Bureau of Inves-

tigation was quietly but thoroughly carrying out a widespread inquiry into possible American connections with the Canadian affair.

White House Silent

Other developments during the day included:

1. The White House declined to comment on a published report that President Truman had received information from the Federal Bureau of Investigation about foreign attempts to obtain atomic energy secrets both in the United States and Canada.

2. Dr. Ralph McDonald, of the National Education Association, warned the Senate committee on atomic energy that it was "inevitable" that there should be a network of foreign spies seeking secrets of the United States atomic bomb, and urged more and better scientific research as the best safeguard. He added that atomic energy in the hands of a totalitarian government would be "dangerous to all mankind."

3. Commander Stephen Brunauer, who was associated with the Army's "Manhattan Project," told the Senate atomic energy committee that all "fundamental research should be free and unfettered," while Mrs. Harper Sibley, president of the United Council of Churchwomen, urged that all atom-bomb secrets be revealed now as a gesture of good faith to all nations.

4. Representative Ralph W. Gwinn, Republican, of New York, charged in an extension of remarks inserted in "The Congressional Record" that Joseph E. Davies, former Ambassador to the Soviet Union, was guilty of "moral treason" in that his statement yesterday that Russia had the

right to seek United States atomic secrets by use of espionage agents was "encouraging Russian spies to steal our military secrets."

5. The Federal Bureau of Investigation professed complete and profound ignorance on the whole subject of what was going on in Canada.

6. The Canadian Embassy said the F. B. I. was working very closely with the Canadian Mounted Police in connection with the case of the reported spy ring.

Canadian Statement Planned

OTTAWA, Feb. 19 (AP).—The Canadian Cabinet, officially silent since its sensational disclosure last week of a "spy ring," was reported tonight as ready to issue a new statement to clear the air of wholesale rumor and speculation.

Justice Minister Louis St. Laurent said: "There will be a statement just as soon as one can be made without embarrassing the work of investigation now proceeding. The government appreciates the desirability of removing as much public anxiety as possible."

One high source said the government was not so much concerned about the fact that a foreign power had means of gathering secrets within the Dominion as over the fact that highly placed Canadians had been guilty of betraying their own country's secrets.

Truman Will Appoint Civilians To Assess Tests of Atomic Bomb

By Jack Steele

WASHINGTON, Feb. 19.—An all-civilian board of five or six members will be appointed by the President to evaluate the results of the atomic-bomb tests on the fleet and render an impartial verdict on the effectiveness of the new weapon against sea power, the White House revealed today.

Actual control of "Operation Crossroads," in which atomic bombs will be dropped upon ships for the first time, will remain in military hands, however, Charles G. Ross, White House press secretary, reported.

The Joint Chiefs of Staff, under whose directions the plans for tests beginning May 15 off Bikini Atoll in the Marshall Islands are being made, will retain full authority over the operation, it is understood, with Vice-Admiral William H. P. Blandy directing the experiment as commander of Joint Task Force 1.

When the tests have been completed and military experts and scientists have compiled their technical data on the results, final authority for determining the effectiveness of the bombs against warships will rest with the new civilian evaluation board, described by Mr. Ross as a sort of "supreme court" for judging the experiment.

A second purely military evaluation board, plans for which have already been completed by the Joint Chiefs of Staff, is also expected to study the results of the tests, but in a subservient capacity to the newly-projected civilian group. The relationship between the two boards had not been fully determined.

Mr. Truman's decision to appoint the civilian evaluation board marks a victory for Senator Brien McMahon, Democrat, of Connecticut, chairman of the Senate committee on atomic energy, who recently urged the President to take such a step to guarantee an "honest count" of the test results.

Among those reported to have been considered by the President for membership on the board are Dr. Karl T. Compton, president of the Massachusetts Institute of Technology; J. Robert Oppenheimer, head of the atomic-bomb installation at Los Alamos, N. M.; Bradley Dewey, Boston chemist

and former Federal rubber director; Owen J. Roberts, former associate justice of the Supreme Court, and Stephen T. Early, former White House press secretary.

Opposing Views of Test

The Navy sees the forthcoming test as a test of a weapon now in existence, planned to explore the damage that the atomic bomb used over Hiroshima and Nagasaki can do to floating vessels.

The atomic scientists hold that the only proper test would be one in which a bomb was designed for use against ships, and utilized most effectively for the destruction of ships. The Nagasaki bomb, they assert, was a weapon against land targets.

The Navy's point of view is made clear in their choice of technical director for Operation Crossroads. He is Dr. Ralph Sawyer, of the University of Michigan, a widely known scientist in the field of spectroscopy. His knowledge of the atom bomb, until he assumed this post, came solely from what he has read about it. He was never connected with the Manhattan Engineer District Project, and played no part in the development of the bomb.

Dr. Sawyer has, however, been a high-ranking member of the Navy's Bureau of Ordnance during this war, and served as a lieutenant commander during the First World War. His qualifications for the post of director of the coming test are those of an ordnance man, and not of a nuclear physicist.

Non-Participating Scientists

The principal figure in the development and first use of the atomic bomb was Dr. J. Robert Oppenheimer. He has not been invited to take part in Operation Crossroads. Dr. Kenneth Bainbridge, who supervised the entire set-up of the New Mexico test, is now back at Harvard University, and will not participate. Dr. Enrico Fermi, director of the Advanced Development Division in New Mexico and one of the men who might do most to develop a more effective sea bomb, is at the University of Chicago and will not participate.

Dr. George B. Kistiakovsky, head of the explosives section, is another who has left the project. He too is back at Harvard. Dr. Robert F. Bacher, who directed the actual assembly of the bomb, is now at Cornell, as is Hans A. Bethe, another of the high-ranking nuclear physicists.

Others who stood high in the original test, and who will not take part in the new ones, are Dr. John H. Williams, Dr. Robert Wilson, Dr. John Manley, Dr. Frank Oppenheimer, Dr. Bruno Rossi, Dr. Kenneth Greissen, Dr. Victor F. Weisskopf and Dr. Herbert L. Anderson. Although many of these men are still with the Manhattan Project in New Mexico, most or all of them will be gone by the time the bomb is dropped over Bikini Atoll in May.

The sole survivor, in a top ranking position, is Dr. William Penny, who was a British participant in the original test. In the coming test, Dr. Penny will be in charge of the damage survey group.

Object to Nature of Test

Many of the men who have been invited to take part declined because of the nature of the test. The atomic scientists have said on several occasions that the atom bomb used over Japan could do only minor damage to ships. Any ship near by, they say, would be sunk, but at a few hundred yards a ship would escape with only minor damage.

They fear a test in which ninety-four of the ninety-seven target ships will come out unscathed. The public reaction, they believe, will be to discount the atom bomb and support a large navy.

The Navy's point of view, on the other hand, is that the atom bomb is a weapon-in-being, and it is the function of the Navy to test all weapons—a procedure that goes on daily at sea.

A deep water test, in which the bomb would be detonated far below the surface, would take more than a year to prepare, the Navy feels. Such a test is planned next year.

Atom Scientists Shun Navy Test As Inconclusive

None Who Had Leading Part in Creating Bomb Will See It Tried in Pacific

HT By Stephen White 2/20

The atom bomb test in the Pacific this summer is being planned and will be carried out without the active participation of any of the scientists who directed the New Mexico test and the bombings of Japan, it was learned yesterday.

None of the scientists mentioned in the Smyth report as responsible for the direction of the first test will take part in Operation Crossroads. Neither have any of their first-ranking assistants agreed to participate. In many cases, these men have not been invited. Others were invited to play minor parts in the Marshall Islands test, and refused because of dissatisfaction with the manner in which it is to be set up.

Behind this severance of the scientists from further work on the weapon they have created a fundamental disagreement between the Navy and the makers of the atomic bomb.

HT The Test of the Bomb 2/21

The end of the world war left the question of air attack upon surface naval vessels a matter of bitter dispute, and in June and July of 1921 a famous series of tests, under the supposedly equally balanced direction of the Army and Navy Joint Board, was undertaken off the Virginia Capes with the purpose of illuminating this critical problem in military technology. These tests were an almost perfect example of how not to do it. General "Billy" Mitchell's aviators were convinced that the Navy's one aim was underhandedly to prevent a demonstration of the true power of the air; the Navy was convinced that the one aim of the aviators was to make unwarranted publicity out of target-range results that could never be duplicated in war. The aviators trumpeted the indubitable fact that their bombers did sink the ex-German target ships and drew therefrom all sorts of unwarranted conclusions—some of which read very queerly today. The joint board, admitting that the airplane was a serious new factor in naval war, solemnly laid down the dictum that "the battleship is still the backbone of the fleet" and drew unwarranted conclusions of its own—as well as some, such as the recommendation for adding effective anti-aircraft to surface vessels, which were wholly sound but were never acted on.

Two decades later war overtook us. It caught our battleships almost naked against the terrors of air bombing and air torpedo attack; it also caught our Army aviators nearly devoid of the armament, equipment, tactical doctrine and training necessary to make their weapon effective at sea. While the Navy, oddly enough, had been sufficiently scared by the 1921 trials to develop its own air arm to a somewhat higher state of readiness for the problems of sea war than the Army had done, both services, as a matter of fact, had to go to a long and bloody school after Pearl Harbor to learn the essentials of their trade under the new conditions—essentials which a dispassionate, scientific and non-propagandist analysis might well have deduced from the lessons of the 1921 and subsequent experiments.

That is past history; it would be of no importance now were it not that the atomic bomb and the unanswered question of its effectiveness in maritime warfare have raised a problem almost exactly analogous to that of twenty years ago, and have raised almost exactly the same childish clamor of service jealousies and propagandist anxieties as were rife in Billy Mitchell's day. Neither side seems to have any concern with the idea of a scientific analysis of the results of a carefully controlled experiment. The Army's one fear seems to be that if not enough ships are exposed to (and sunk by) the atomic bomb the public will conclude that the bomb is of minor importance; the Navy's one fear seems to be that if it sinks too many ships at a time the public will too hastily discount the value of all ships. The simple idea of ascertaining the truth, regardless of what the public may think about it, seems to have occurred to no one.

Consequently, the President has announced the intention of appointing a civilian board as a final court for evaluating the results. Since the final power resides in the evaluation, this has caused untold anguish on all sides. The layman will not be greatly impressed. If the services cannot demonstrate a capacity to deal scientifically and intelligently with so basic a problem of military technology as that presented by the atomic bomb, then civilian means will have to be found to check their rivalries and enforce dispassionate conclusions. As we have suggested before, this will be "Operations Crossroads" for the services as well as for civilization.

THE OTTAWA AFFAIR 2/22

Some American observers have already explained to their satisfaction on Russia's share in the process by which "certain information of a secret character," admittedly having to do with "military questions and also atomic energy," was obtained in Ottawa by the Russian military attaché without the original knowledge of the Canadian Government. These American observers say that as long as the Western democracies continue to withhold information about atomic energy from Russia the Russian Government has "every moral right" to seek such information, by espionage if necessary. It is significant, however, that the Russian Government itself does not advance this claim. The Russian Government, indeed, sets a high value on military secrets and wishes to protect them properly. Just two weeks ago, when a Philippine resolution came before the UNO Assembly calling for the opening of "all sources of official news" to everybody, the Russian delegate cast his vote against it and asked the question: "Does the Philippine delegate mean he wants a War Office—which is an official source of news—to be open to all?"

Just how widely open to the Russians the Canadian War Office was, in this particular instance, is a matter of discussion. The Russians say they learned nothing which they did not know already. The Canadian Government has still to make a formal statement of the results of its own investigation. Meanwhile, we are left, on the basis of the official Russian declaration in the case, with both an acknowledgment and an accusation. The acknowledgment is that the Russian Government recognized the impropriety of the action taken in its behalf and recalled its military attaché from Ottawa "in view of the inadmissibility of the activities" of certain members of his staff. The accusation is that the few purely factual statements about the incident which have appeared thus far in the Canadian press are evidence that "an unbridled anti-Soviet campaign was part of the plan of the Canadian Government," that this campaign was "aimed at inflicting political harm to the Soviet Union" and that it was deliberately undertaken because of Canadian dislike for Russia's championship of "the principles of democracy" in the recent London conference on the UNO Assembly. In view of the record written at London, and Canada's share in writing it, this part of the story, at least, can be dismissed as fantastic.

ASSEMBLY TO PASS ATOM PLAN TODAY 2/23

Session Moved Up a Day as Committee Ends Discussion —Speed on Trusts Urged

By SYDNEY GRUSON

By Wireless to THE NEW YORK TIMES.

LONDON, Jan. 22—The sparks from the political fireworks exploded in the Security Council have not affected the committee work of the United Nations General Assembly. In a fifty-minute session today the Political and Security Committee finished its general discussion on establishing an atomic energy commission.

As a result, the plenary session of the Assembly was moved up a day and will be convened tomorrow afternoon to put the last formal touch on the formation of the commission, to be composed of the eleven members of the Security Council and Canada.

Some of the misgivings about the commission's composition and its responsibility to the Security Council, rather than the General Assembly, are expected to be aired tomorrow, but the resolution will not encounter major opposition.

Today's committee discussion was, as Tomas Cabili of the Philippines observed, "rather academic" since the committee had voted yesterday to adopt the resolution.

Australian for Acceptance

The session was noteworthy for a speech by the Australian, N. J. O. Makin, who said that the resolution should be adopted because of its "transcendent importance" even though he held that two parts of it were difficult to accept.

He said the membership was "not freely chosen from amongst the members of the United Nations as a whole" and the commission would not be responsible to the Assembly because the Security Council would decide which of its reports would be transmitted to that body.

Mr. Makin said that the "act of faith" by the delegates who voted for the resolution yesterday called for a corresponding act of faith by the members of the commission "to insure that the overriding interests of all members of the United Nations are constantly kept in mind."

The members, he added, should make sure that all information that can be made public within the limits of security is given to the world and that all reports that should be considered by the Assembly or other organs of the UNO are transmitted to these bodies.

The Australian drew attention to a provision of the Charter by which the members undertook to provide "armed forces, assistance and facilities" for the maintenance of peace and security.

It may become necessary, he said, to consider the question of atomic weapons as well as other means of making war when the special agreements by which these forces, assistance and facilities are to be provided are drawn up between the UNO and member states.

Russian Resists Revision

Andrei A. Gromyko, Soviet delegate, resisted any idea of changing the wording of the resolution, drawn up at the last Big Three conference in Moscow, after Cyro de Freitas-Valle of Brazil had expressed regret that the commission would lose the experience of a member when that member ceased to belong to the Security Council.

In the Trusteeship Committee, where a general discussion on mandates is proceeding, Heaton Nicholls of South Africa declared that the Charter set out the position that the mandatory powers were not obligated to transfer their mandates to UNO trusts.

Answering a blunt speech yesterday by Prime Minister Peter M. Fraser of New Zealand asking France and South Africa to accept

the authority of the Trusteeship Council, Mr. Nicholls said that the Union of South Africa was determined to sound out the wishes of the people and Legislature of Southwest Africa [a South African mandate] and then present the case for federation of the mandate with the Union before the Assembly. Mr. Fraser said afterward that this assurance that the Assembly would be consulted was a "long step forward."

Opening the discussion, Arthur Creech-Jones, British Under-Secretary for Colonies, said that the committee should get on with the job of recommending to the Assembly the immediate stages that must be started to bring the trusteeship system into being. Sufficient declarations have been made by the administering authorities, he said, for a start to be made without South Africa and France.

There Are Abundant Sources of Uranium for Those Who Are Willing to Pay a High Price

NYT

By WALDEMAR KAEMPFERT

2/24

In all the bills thus far framed to control atomic energy as well as in all the statements issued by President Truman, Prime Minister Attlee and others in high places, Government ownership of uranium supplies and strict regulation of traffic in uranium is called for. All this presupposes that the deposits in the Katanga district of Africa, Canada, Colorado and other places are the only sources. The Atomic Scientists of Chicago have their doubts, which are expressed in the bulletin that they issue.

Granite contains some uranium—as much as an ounce to a ton of rock. Even the ocean contains some. There is a thousand times more uranium than gold in the earth's crust and more than cadmium, bismuth, silver, mercury or iodine.

Until the atomic bomb was developed uranium was strictly a by-product of mining carried on in Africa and Canada. The deposits of Joachimsthal in Czechoslovakia and of Colorado never paid for that reason. All this has been changed by the advent of atomic energy. There is no need to worry about the exhaustion of known uranium deposits, since uranium is to be found everywhere. Moreover, a power bent on producing atomic bombs and denied access to the deposits of Africa, Canada and the United States will simply turn to its own rocks. Costs mean nothing to a war lord.

Compared to Gold

The Atomic Physicists of Chicago point out that ores are commonly mined which contain only one-fifth of an ounce of gold per ton of rock. There are vast quantities of rock which contain from one-fifth to one ounce of uranium per ton. "If society decides that uranium is to be as valuable as gold, then practically unlimited quantities of uranium are available for use in supplying atomic energy." The carnotite deposits of Colorado may yet become highly profitable.

If the UNO is thinking of abolishing atomic warfare by controlling uranium traffic it has a formidable task before it. "In so far as controls and inspection are concerned," say the Atomic Physicists of Chicago, "it appears that any country could secure large amounts of uranium without a good probability of detection."

There are undeniable difficulties in exploiting rocks for the little uranium that they contain. To obtain one ton of uranium it would be necessary to quarry at least 40,000 and possibly 250,000 tons. So huge an enterprise could hardly be concealed. Much heavy machinery, an army of workers, immense amounts of explosives and chemicals, extensive transportation facilities would be needed. All this argues in favor of inspection, in which this department never had much faith.

Special Powers to Block Leaks On Bomb Considered in Senate

HT By Jack Tait, 2/26

WASHINGTON, Feb. 25.—A move to block leaks to foreign powers of atomic-bomb secrets by delegating special powers to the Civilian Control Commission which will be set up under the final atomic-control bill is under consideration by the special Senate committee on atomic energy, it was learned tonight.

Under such a provision, it was said, the commission would be given power—subject only to the veto of the President—to take action in certain cases concerning the atomic bomb against spies and enemy agents who might otherwise seek protection in the loopholes of the national espionage acts.

The problem of devising adequate provisions for protection of the atom-bomb secrets emerged today as the No. 1 task of committee members, who met in closed session this morning to speed the

final writing of an atomic-control bill.

Senators on the committee indicated privately after the session that they were dissatisfied with present American espionage as a safeguard against leakage of atomic secrets. They declared they would see that stringent security regulations were a part of the final committee draft of the atomic-control measure.

Under present peace-time espionage laws, the prosecution must show both "intent" to injure the United States and "intent" to aid a foreign power on the part of a suspect. An American accused of giving secret information to a foreign power, then, could make a defense on the ground that he did not intend to harm the United States or give aid and comfort to another nation.

Stirred by the current spy plot uncovered in Canada and by its

possible ramifications, the committee has recalled Major General Leslie R. Groves, chief of the atom-bomb project, for further testimony, expected to concern in the main his views on tightening the espionage laws.

General Groves, a frequent witness before the committee in both open and closed sessions, was first scheduled to testify tomorrow, but a previous engagement forced postponement of his appearance until Wednesday morning.

Senator Brien McMahon, Democrat, of Connecticut, chairman of the committee, told reporters after today's closed session General Groves would be recalled to give his "personal and individual" views and would testify as "a citizen." This qualification apparently would give the general greater latitude in his testimony.

A spokesman for General Groves said today his chief would undoubtedly tell the committee that

atomic-control bills now under consideration were lacking in proper safeguards against espionage in relation to the military phases of atomic developments and would ask for "strong protection" along this line.

Most members of the committee queried today preferred to remain anonymous. But Senator Edwin C. Johnson, Democrat, of Colorado, said: "My guess is that General Groves will want something done about tightening up the espionage laws. That certainly is the thing that will have to be done. It is one of the most important parts of the bill."

Another Senator said: "There seems to be a growing feeling in the committee that the gaps in our espionage laws must be closed if we are going to stop atomic-bomb leaks. There is a question, however, whether we should try to amend the espionage acts themselves or include a special code in the bill dealing with atomic-bomb control."

Representative Hatton W. Sumners, Democrat, of Texas, chair-

man of the House Judiciary Committee, pointed out today, however, that efforts to amend or fortify the espionage laws had met strong opposition in the past and had been generally unsuccessful.

Apprised of reports that intelligence agencies of the War and Navy Departments were dissatisfied with present espionage regulations, Representative Sumners said: "If War or Navy intelligence will get in touch with me, I'll be very interested in trying to do something about it."

Senator McMahon said the committee had made no specific progress in writing the atomic-control bill today, but he said "a thorough discussion" of the principal problems involved was carried on. These include: the composition of the national control commission; prevention of espionage; extent of secrecy necessary; patent provisions, and liaison between the military and the control commission.

He predicted the committee would have the bill ready for the Senate "within two weeks."

HIGH OTTAWA AIDES HELD IN SPY CASE

One Holds Rank Just Below Deputy Minister—Defense Lawyers Hit Procedure

NYT 2/27
OTTAWA, Feb. 26 (AP)—The thirteen suspects in Canada's espionage case—their identities still a state secret—include "public officials and other persons in positions of trust," the Ministry of Justice said today in a statement.

The statement disclosed that Prime Minister W. L. Mackenzie King on Feb. 5 informed the committee of the Privy Council "that * * * secret and confidential information has been communicated directly or indirectly by public officials and other persons in positions of trust to the agents of a foreign power."

The "foreign power" has not been officially identified here but Soviet Russia has formally acknowledged receiving some secret information from Canadian sources.

Until today the spy suspects—eleven men and two women—had been described only as "employees or former employees" of Government departments or agencies.

It is understood that one of the thirteen is near the rank of Deputy Minister, the highest civil service position in the Canadian Government.

Broad Powers Described

Apparently in answer to criticism by lawyers of the stern measures invoked to keep the case secret, the Ministry of Justice statement described in detail the broad powers delegated to the Royal Commission assigned to the investigation.

The commissioners, Supreme Court Justices Robert Taschereau and R. L. Kellock, are empowered to summon and question witnesses and order them to produce any documents or articles requisite to the investigation.

The Royal Canadian Mounted Police is authorized to enter any premises occupied or used by suspects, to search the premises and every person found there and to seize any article that might be used as evidence.

"The said commissioners may adopt such procedure and method as they may deem expedient for the conduct of such inquiry and may alter or change the same from time to time," read the most sweeping paragraphs of the statement.

No applications for release under habeas corpus proceedings have been filed. To do so, an attorney would have to risk public identity of his client and violate the secrecy clamped on the case.

Procedure Is Protested

Special to THE NEW YORK TIMES.

OTTAWA, Feb. 26—It was in reply to protests condemning the action of the Government in suspending the constitutional rights of the thirteen persons now detained on suspicion of having communicated secret information to foreign agents, that the Ministry of Justice today published the Order-in-Council of Oct. 6, 1945, under which these persons are detained, it was disclosed.

The protest, made by several lawyers retained to defend the prisoners, is directed against the revival in peacetime by Orders-in-Council of restrictions on the personal liberty and legal rights of the persons detained who have no charge laid against them.

It is proposed to ask the County Bar Association at its meeting on Friday to give support to the request that the "objectionable features" of the Order-in-Council be repealed forthwith and that such charges as the evidence warrants be made against the persons detained or that they be set free.

It is urged in the proposed motion that Canada is pledged before the world to uphold the very liberties of which these Canadian citizens are now deprived.

The persons detained have not until now been permitted to see the lawyers who have been engaged to defend them or to have any communication with their families except by censored letters. Some of them have been allowed to draw checks for the support of their families against their private funds.

Byrnes Reiterates Statement

Special to THE NEW YORK TIMES.

WASHINGTON, Feb. 26—With some show of irritation, Secretary of State James F. Byrnes repeated at his news conference today previous declarations that no responsible official of the Canadian Government had notified the State Department or the White House of the implication of any American citizen or American official in its current spy investigation.

He said he had previously made this statement publicly as well as to the Senate Atomic Energy Committee and that President Truman had publicly confirmed it.

"I hope you won't consider me impatient," he said, "if, the next time, I don't answer that question."

BOMB MAKERS ASK AID TO ATOM WORK

Legislation to Insure Proper Use for Peace Is Pressed at Dinner of Engineers

In recognition of the atomic bomb as the outstanding chemical engineering achievement of the war, the biennial award of Chemical and Metallurgical Engineering, a journal of the McGraw-Hill Publishing Company, was presented last night to Maj. Gen. Leslie R. Groves and to the representatives of 117 industrial enterprises and universities that cooperated in making the bomb.

Two thousand leaders in education, chemistry and engineering attended a dinner in the Hotel Waldorf-Astoria at which the award, a scroll, was made. It was presented by Dr. Alfred H. White, chairman of the committee of award and Professor Emeritus of the Department of Chemical and Metallurgical Engineering of the University of Michigan.

General Groves urged Americans to remember that the nation's real goal should be "not to outlaw the atomic bomb, but to outlaw war."

Desire for Peace

"There is an overwhelming desire for peace in America, but are we sure that in the hearts of other nations and peoples the same desire exists?" he asked. "There can be no half-way position. With every desire for good-will to the rest of the world, let us approach our own problems with common American horse sense."

The general urged legislation by Congress to insure the proper utilization of nuclear energy for the peaceful advancement of national and international welfare. He emphasized that atomic energy represented a new force whose benefit to mankind no person was able to estimate but which also had destructive powers that could doom civilization.

"Atomic energy, although still uncontrolled, can now be released on a tremendous scale," he said. "However, the prospects of controlling and using this energy for industrial purposes promise a far-reaching advancement in our civilization."

Research and Development

"Continued research and development must go on to devise ways and means of converting this untold energy into useful work. Reports that limitless energy will be available from a superabundance of power, light and heat, that streamliners will be running across the continent on the atomic energy of a thimbleful of water are entirely within the realm of speculation; in fact, beyond it."

General Groves declared that this country must maintain its lead position in atomic research by "aggressive leadership in scientific and industrial investigation." He asserted that "unfettered" initiative and ingenuity of American science and industry would insure such leadership.

Dr. James Bryant Conant, president of Harvard University, pointed to the teamwork between science and industry in the development of the atomic bomb and urged continuance of that teamwork to meet the problems of the future.

U. S. Seeks Plan For World Atom Plant Scrutiny

State Department Men and Group Named by Groves Draft Policy for Truman

HT By Jack Tait 2/28

WASHINGTON, Feb. 27.—A special committee in the State Department is working out a plan for atomic-bomb control based on a world-wide inspection system of all production of fissionable products, it was learned tonight.

Decisions and recommendations of this committee would take precedence over those of another group working along the same lines, which was appointed by Major General Leslie R. Groves as head of the atomic-bomb project. General Groves revealed the existence of the latter committee while testifying today before the special Senate committee on atomic energy. Its report is expected to be prepared by March 8.

The recommendations of the Groves committee, composed entirely of scientists under the chairmanship of Dr. Manson Benedict, of Westfield, N. J., it was said, will "certainly influence" the State Department committee in devising a final plan for world inspection. But it was emphasized that the State Department group will present the "official" conclusions.

It was assumed here tonight in some quarters that the final State Department plan, after approval by President Truman, would be submitted to the governments of Great Britain and Canada and, if found agreeable to those nations, would be presented to the United Nations Atomic Control Commission for consideration.

The composition of the State Department committee has not been revealed. The Groves committee comprises nine scientists under Dr. Benedict, who was associated with one of the prime contractors on the atom bomb project at Oak Ridge, Tenn.

General Groves's reference to the latter committee during his testimony today perplexed some of the Senators present. He was asked just what it was. He replied: "its task is to come up with a plan of how atomic energy programs can be inspected throughout the world so no one can make the bomb without our knowing it."

General Groves, appearing before the Senate committee to give his "personal views," gave testimony at variance with the published views of President Truman and Robert P. Patterson, Secretary of War, in regard to the composition of the proposed domestic atomic control commission.

Warning that any control legislation should be shaped with the idea that the new power will be used primarily as a military weapon, General Groves said he favored the appointment to the commission of from two to four Army and Navy officers.

President Truman has favored a commission composed entirely of civilians, while Secretary Patterson, although favoring a civilian body, has been firm in his contention that the military be given some voice in formulation of the commission's policies.

General Groves appeared before the committee last week in secret session. His testimony today revealed that he then emphasized the need for stringent security regulations for control of atomic secrets. He reiterated his belief that no defense against the atomic bomb is in sight.

In recommending control of the program by a nine-man part-time commission, he said he would automatically disqualify from membership such prominent men as Dr. James B. Conant, president of Harvard, and Dr. Karl T. Compton, head of the Massachusetts Institute of Technology.

Both institutions, he said, were too involved in nuclear research. He urged that presidents of such "smaller colleges as Amherst, Williams and Lafayette" be considered.

He also said that representatives of the General Electric Company and the Westinghouse Electric and Manufacturing Company should be barred from membership, as those companies have been too intimately connected with the atomic program.

Bomb and Opportunity

HT By Henry L. Stimson 3/1

(This article, of the former Secretary of War, is reprinted from the current issue of "Harper's Magazine" with the kind permission of the editors.)

The advent of the atomic bomb has created a profound impression in all quarters of the globe. Bidden or unbidden, the atomic bomb sits in on all the councils of nations; in its light all other problems of international relations are dwarfed. This is so not because these other problems are no longer important in themselves, but because the question of the control of the atomic bomb towers above all else. No other problem has been so constantly in my thoughts as this one.

If the atomic bomb were merely another—though more devastating—military weapon, which could be assimilated into the customary pattern of international relations, conceivably we could then follow the old pattern of secrecy and sole reliance upon national military superiority, and depend upon international caution to stay the future use of the weapon.

But, to my view, the recent unlocking of atomic energy constitutes a first step—and only a first step—in a new control by man over the primal forces of nature too revolutionary and dangerous to fit into the old patterns. The military application of this discovery underscores most sharply the divergence between man's growing technical power for destructiveness and his psychological power of self-control and group control—his moral power.

If this is so, how this problem is approached in the sphere of the relations among the nations is a question of the most vital importance in the evolution of human progress.

The chief lesson I have learned in a long life is that the only way to make a man trustworthy is to trust him; and the surest way to make him untrustworthy is to distrust him and show your distrust.

And it is from this lesson that I draw the conviction that only a direct and open dealing with other nations on this, the most pressing problem of our time, can bring us enduring co-operation and an effective community of purpose among the nations of the earth. It is the first step on the path of unreserved co-operation among nations which is the most important.

Once the course of national conviction and action is set in this direction by the example of the major powers of the world, petty differences will be recognized for what they are, and the way toward a real fraternity of nations will be open.

We must not delay. The poisons of the past are persistent and cannot be purged by timid treatment. By its sole possession of the bomb, at least for the present, the United States finds itself in a position of world leadership. But this solitary possession is most certainly very transient. It must recognize this and act swiftly. It must take the lead by holding out an open hand to other nations in a spirit of genuine trust and with a real desire for a thorough-going co-operative effort in meeting and solving this problem. Truly this is a time for greatness of heart and of purpose, and unless we demonstrate these qualities now, other nations cannot be expected to do so.

The development of atomic energy holds great, but as yet unexploited, promise for the well being of civilization. Whether this promise will be realized depends on whether the danger of swift and unprecedented destruction can be removed from the earth. Whether it is removed depends on whether we and other nations move firmly, quickly and with frank transparency of purpose toward the goal of uniting all men of good will against the appalling threat to man's very existence. The focus of the problem does not lie in the atom; it resides in the hearts of men.

UREY SCORES ARMY ON ATOMIC POWER

Attacks Insistence on Keeping
Control—Admits Scientists'
Quarrel With Engineers

NYT

3/3

Dr. Harold C. Urey, Nobel Prize winner and one of the ranking scientists in the development of the atomic bomb, criticized yesterday the Army's Manhattan District Engineer Corps for its insistence that the control of atomic power be vested in the military. Five other experts on atomic power, who were at the interview, issued a statement endorsing Dr. Urey's criticism.

Dr. Urey also assailed Maj. Gen. Leslie R. Groves, head of the Army's atomic bomb project, for recommending severe press curbs during the forthcoming atomic bomb experiments at Bikini.

Asserting that reports were circulating of a quarrel between the atomic scientists and the Army, Dr. Urey said these were not correct, but that "there is a quarrel between the atomic scientists and the Manhattan District Engineer Corps of the Army." He said there also was a "quarrel" between the Army's Ordnance Department, as well as the Navy, and the Manhattan District.

If the people of the United States "are awake," Dr. Urey declared, "they will realize that they have a quarrel too" with the Manhattan District, "as, indeed, the whole world has a quarrel with that organization."

Sees Constitution Ignored

By insisting on military control of atomic power, Dr. Urey said, the Manhattan District "has practiced and wishes to practice a whole number of things contrary to the Bill of Rights of the American Constitution."

Dr. Urey, who discussed the atomic bomb question during an interview at the headquarters of Americans United for World Organization, 1860 Broadway, expressed dismay at what he characterized a "deplorable trend" that Congress might revise its plans and decide to turn over atomic control to the military.

He said this trend was encouraged by stories that a defense had been found for the atomic bomb. The truth is, Dr. Urey said, that there are no real defenses against the bomb. He also blamed the trend on "spy scare" stories, referring particularly to the recent disclosure by Canada that representatives of the Soviet Union had obtained technical information on the bomb.

He said there was no such thing as a "secret of the atomic bomb," explaining that, even if there were, no particular blame should be leveled at Russia because "as the world is organized, all nations will spy, including our own." He added that the "spy scare in Canada" had been dealt with exhaustively in the United States press but that "the only statement which so far makes any sense was that made by Russia."

Data in Smyth Report

Referring to the Russians' assertion that they had obtained no information of value because it was told in greater detail in the Smyth report, Dr. Urey said that the report contained "most of the information that spies could possibly collect." Detailed data on the atomic bomb, he declared, would

require "eighty to ninety volumes of close print," which only a scientist or engineer would be able to read.

"Any spies capable of picking up this information," Dr. Urey added, "will get information more rapidly by staying at home and working in their own laboratories."

He had high praise for the report of Professor Henry DeWolf Smyth of Princeton University, saying that the cost of our atomic bombs might have been cut by a quarter and the production time by one to two years if the report had been available before research work was started on the bomb.

No scientist would suggest, Dr. Urey went on, that the manufacturing details of the bomb be given away, but scientists do insist that there are "some things that must be made public if we are to have a healthy science and trained scientists."

The five other scientists who were present at the interview were Dr. Bernard T. Field of the Massachusetts Institute of Technology; Dr. Aaron Novick of the University of Chicago; Dr. Lyle Borst of

Oak Ridge, Tenn., and Drs. I. Kaplan and Clarke Williams of the Special Alloy Materials Laboratory (Manhattan Project subdivision), New York. All are members of the Federation of Atomic Scientists.

"Most Important Problem"

Special to THE NEW YORK TIMES.

ATLANTIC CITY, N. J., March 2—Dr. Harold C. Urey, noted scientist, told the seventeenth annual convention of the Y. W. C. A. here tonight that proper control and proper development of atomic energy was the "most important problem facing humanity at this time."

"Just as World War I ended with the airplane and World War II started with it," he said, "so we may expect World War III to start with the atomic bomb, which was developed at the end of World War II."

Dr. Urey called for support of a world government, and said that the United Nations Organization was a start "where, at least, for the first time difficulties between States are being discussed in the

open." He maintained, however, that the UNO, as presently organized, could not be regarded as world government, "for such government must be expected to have sovereignty in at least certain limited fields, and it must have legislative, executive and judicial functions—none of which the UNO possesses at this time."

ATOM SAFEGUARD PLAN PUTS GROVES UNDER FIRE

His Doubt Over Safety of Releasing
Secrets Spurs Attacks From Within
And Without the Congress

HIS VIEWS FIND SUPPORTERS

By ARTHUR KROCK

WASHINGTON, March 2—Maj. Gen. Leslie R. Groves, under whose direction of the "Manhattan District Project" was developed the atomic bomb that hastened the end of the war with Japan, is now undergoing an experience to which other men of achievement have been subjected. He is under attack in Congress, in scientific circles and in groups with firm faith that all the powerful nations now have intentions as peaceful as our own, for his program on atomic energy.

This program is for continuing all existing safeguards of the process by which atomic bombs can be manufactured, and it is based on these beliefs held by General Groves:

The process, now known only to the United States, Great Britain and Canada and capable of industrial completion in this nation alone, will remain thus exclusive for from five to fifteen years at least. In the present disturbed state of the world, it should be viewed as an essential military secret. It will probably be many more years before atomic fission can be extensively applied to the industrial economy of peace within a price-range to encourage that use.

Inspection System Advocated

In the meantime, all possible steps should be taken by the United Nations to permit exchanges of information that will hasten the era of peaceful use. But this exchange must not begin until an effective inspection system is in force in all countries, and no present policy of Soviet Russia encourages the belief such a system would yet be possible there.

During the period of preparation for this exchange, the whole field of atomic energy in this country should be organized under a national policy and board of control. But from this board the military authority should not be barred, as is proposed in the bill sponsored by Senator Brien McMahon of Connecticut; the military should be given latitude to develop atomic weapons which the bill denies; and the proposed board should be nine rather than three, so as to prevent the exercise of too much power by the middleman of the group.

These are the broad ideas of General Groves which have produced a situation in which he has been accused of (1) inviting another war, preceded by a vast rearmament contest among the great nations; (2) favoring a fascist military control of atomic energy and thus blockading its advancement in the realm of peaceful science; (3) trying to make himself the chief figure in that control, and (4) violating the rule of subordination by opposing certain positions held by the President and the War Department.

Reply to the Charges

As for the first charge, General Groves does not accept its reasoning, and few of the top-flight scientists engaged on the bomb project have expressed agreement with its conclusion. As for the second charge, General Groves has on occasion appeared unnecessarily rigid in his secrecy rules, but now he has relaxed sufficiently to approve control by a civilian board on which the military would be the minority and independent of the service. This correspondent does not believe there is any foundation for the accusation, the third, that the general is trying to run the atomic show hereafter. And, though it is true that before the McMahon committee he expressed certain opinions differing from those of the President and the War Department, the committee sought them, he offered them as his personal views and was authorized to do so by the department.

Among the leading scientists in the bomb project were Vannevar Bush, James B. Conant, A. H. Compton, J. R. Oppenheimer, E. O. Lawrence, H. C. Urey and Leo Szilard. While there is no meeting of minds in this group on all points of the future program, there is no evidence of major disagreement with General Groves except on the parts of Dr. Urey and Dr. Szilard. Below this high tier, however, and among some of the lesser scientists who worked on various phases of the project, the dissenters have been more numer-

ous. And that has stimulated the attack now centered on General Groves. How extravagant this has become is illustrated by the report of the "committee on declassification" of which Dr. Richard C. Tolman, dean of the Graduate School of the California Institute, was chairman.

Two Extreme Views

General Groves set up this committee to recommend a program for the release of scientific and technical information obtained during the bomb project. The committee was all in favor of that release and reported that "much can be disclosed at the present time without danger to our national security"—which is all the military authorities want to assure. It recommended specific topics on which these disclosures could be made. But on "topics of a critical scientific nature" the committee recommended no present release. And it held that the President and Congress should evolve a national policy before "topics of a military nature" should be circulated. It is the details of that policy on which the present disagreement has come, the two extreme points of view having taken form in the House May-Johnson bill and the Senate McMahon bill.

The Tolman committee cited the release of the Smyth report last August, soon after the bombs were dropped on Japan, "as the first step in the establishment of a desirable and rational policy for the release of information." This was approved for publication by General Groves himself.

The probability is that after the present heat of the controversy has abated, legislation striking a balance between the extreme viewpoints will be passed by Congress and approved by the President. It seems improbable that the design of the McMahon bill to exclude the military from participation in all control of atomic energy development, even to removing its jurisdiction over the development of weapons, will not be accomplished in that legislation. It also seems probable that the vast and unchecked delegation of commission authority in the May-Johnson bill will not be approved by Congress. Finally, the prospect is that when the legislation is enacted its provisions will reflect some of the views of General Groves for which he is now being assailed.

Dissatisfied Views

This outcome will not satisfy those who in all sincerity believe Russia should be taken into full partnership at once and open inspection rights in that country taken for granted. It will not satisfy those who think all safeguards are useless anyhow and that the bomb will be perfected soon by any great nation that was out of the original secret. But it will probably be a more realistic approach to the problem and to an estimate of present world conditions.

Among those scientists whose position in the debate is further from that of General Groves is Dr. Urey. But his associates on the project are not as concerned over this as his distinction might suggest. For in November, 1943, he proposed that no further money be spent on the Clinton, Tenn., plant for the extraction of U-235 until the war was over, saying he was convinced it would make no important contribution to the war. He could be as wrong again.

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Elliott

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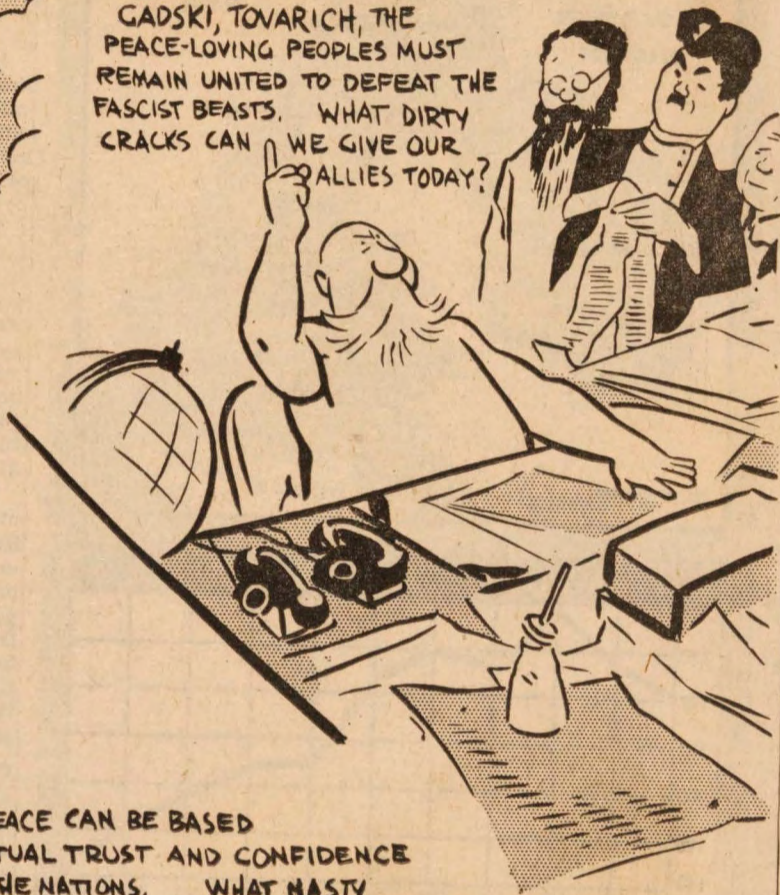
"THE UNITY OF NATIONS"

2/3



"By the way, Low, whatever happened to that fellow you used to draw - Colonel Blimp or Bump or wotsername...?"
"Oh, him? I'm not sure whether he's in Moscow editing PRAVDA or working for UNO in Canada."

GADSKI, TOVARICH, THE PEACE-LOVING PEOPLES MUST REMAIN UNITED TO DEFEAT THE FASCIST BEASTS. WHAT DIRTY CRACKS CAN WE GIVE OUR ALLIES TODAY?



GAD, SIR, PEACE CAN BE BASED ONLY ON MUTUAL TRUST AND CONFIDENCE AMONG THE NATIONS. WHAT NASTY RUMORS CAN WE START ABOUT THE RUSSIANS TODAY?

LOW

Low © All Countries

Canada's Interim Spy Report

OTTAWA, March 4 (AP).—The complete text of the interim report of the Canadian Royal Commission investigating espionage activities, addressed to Prime Minister W. L. Mackenzie King, follows:

Your Excellency:

Pursuant to order-in-council P. C. 411, dated Feb. 5, 1946, we have been conducting the investigation thereby provided for, having commenced our sitting on Wednesday, Feb. 13, 1946. We have now reached a stage in the hearing of evidence which permits us and renders it advisable for us to make an interim report.

The evidence establishes that a network of under-cover agents has been organized and developed for the purpose of obtaining secret and confidential information particularly from employes of departments and agencies of the Dominion government and from an employee of the office of the High Commissioner for the United Kingdom in Canada.

The evidence reveals that these operations were carried on by certain members of the staff of the Soviet Embassy at Ottawa under direct instructions from Moscow. The person directly in charge of these operations was Colonel Zabolin, military attache of the Embassy, who had as his active assistants in this work Lieutenant Colonel Motinov, chief assistant military attache; Lieutenant Colonel Rogov, assistant military attache, air; Major Sokolow, of the staff of the commercial counsellor of the embassy; Lieutenant Angelov, one of the secretaries of the military attache, as well as other members of the staff of the military attache, all of whom, as well as the agents whom they employed in the pursuance of their activities, were, in the interests of secrecy, known by under-cover names.

We have noticed that each of the dossiers compiled by the staff of the military attache with respect to the Canadian agents contains this significant question: "Length of time in net." We think that the word "net" well describes the organization set up and under development by Colonel Zabolin and his predecessor.

We have had before us a former employe of the Russian Embassy at Ottawa, Igor Gouzenko, the cipher clerk of the military attache, who has described this organization and its functioning, and who has produced original documents, the authenticity of which we accept.

As shown by these documents, the specified tasks committed to Colonel Zabolin were the following:

1. As described in telegrams from "the director" at Moscow addressed to Colonel Zabolin under his cover name of "Grant," in August, 1945.

(a) The technological processes and methods employed by Canadians and the English for the production of explosives and chemical materials.

(b) Instructions as to which of the members of the staff of the military attache should contact particular Canadian agents and the suggestion of names of persons in the Department of National Defense for Naval Affairs who might act as agents.

(c) Information as to the transfer of the American troops from Europe to the United States and the Pacific; also the Army headquarters of the 9th Army, the 3d, 5th, 7th, 13th Army Corps, the 18th Armored Division, the 2d, 4th, 8th, 28th, 30th, 44th, 45th, 104th Infantry Divisions and the 13th Tank Division, together with the dates of their moves, the location of the Army headquarters of the 8th and 16th Armored Corps, the 29th and 89th Infantry Divisions, the 10th Tank Division and the location of the Brazilian Infantry Division; whether or not there had been organized a staff for the American troops in Germany and, if so, its location and the name of the officer in command; the location of the 1st Parachute troops and the plans for their future use.

(d) Instructions to take measures to obtain particulars as to the materials of which the atomic bomb is composed, its technological process and drawings.

2. As described in writings under the hands of Zabolin, Motinov and Rogov, during the period March to August, 1945;

(a) To obtain from the National Research Council models of developed radar sets, photographs, technical data, periodic reports characterizing the radar work carried on by the council and future developments planned by the council.

(b) Particulars of the explosives establishment at Valcartier and its work, including the obtaining of formulas of explosives and samples.

(c) A full report on the organization and personnel of the National Research Council; "give more details of organization of research council. Manipulate so as to get to their leaders and find out what they do."

(d) Particular work of specified employees of the research council.

(e) The obtaining of documents from the library of the National Research Council so that they might be photographed, with the expressed intention of ultimately obtaining the whole of the library of the National Research Council.

(f) Particulars as to the plant at Chalk River, Ont., and the processing of uranium.

(g) The obtaining of a sample of uranium-235, with details as to the plant where it is produced.

(h) Specifications of the electro-projector of the "V" bomb.

(i) Research work being carried

on with relation to explosive materials and artillery.

(j) The obtaining of material on the American airplane radar locator type, navigation periscope.

(k) A list of the army division of the Canadian Army which have returned from overseas and the names, or numbers, of the divisions which have been divided, or re-shaped, or undergoing re-shaping.

(l) The number of troops in the Canadian Army in the post-war period, together with the system of its organization.

(m) Information from the Department of Munitions and supply of various kinds relating to guns, shells, small arms, ammunition for small arms arsenals, optical and radio appliances, automobiles and tanks, apparatus for chemical warfare and particulars of plants producing same.

(n) Information as to electronic shells used by the American Navy.

(o) To endeavor to keep agents in government departments threatened with discharge as a result of shrinkage in size of the departments, in order to maintain their usefulness for the future.

(p) Information as to telegrams passing into and out of the Department of External Affairs and the office of the High Commissioner for the United Kingdom.

It must not be assumed that the above list is exhaustive, but it illustrates the nature of the objectives of these operations.

It has been stated to us by commission counsel that the method of presentation of the evidence before us is with the object of ultimately establishing the identity of the greatest number of those persons who have acted as agents, but the question of the relative importance of the above subject matters has not been dealt with to an extent where we are yet able to pronounce upon it. To proceed in any other manner might have been prejudicial to the ultimate attainment of the purposes of the investigation.

It has taken considerable time to hear the evidence relating to the general scheme of the operations being carried on, which evidence it was necessary to hear before dealing with the activities of particular agents.

The evidence heard so far, however, establishes that four persons, namely, Mrs. Emma Woikin, Captain Gordon Lunan, Edward Wilfred Mazerall, Miss Kathleen Mary Willsher, who is an employe of the government of the United Kingdom, have communicated directly or indirectly secret and confidential information to representatives of the U. S. S. R. in violation of the provisions of the official secrets act, 1939, 3 Geo. VI, Cap. 49.

EMMA WOIKIN

This person was employed as a cipher clerk in the Department of External Affairs, having taken the usual oath of secrecy required in such cases. Taking advantage of the position she occupied, she communicated to Major Sokolow the contents of secret telegrams to which she had access in the course of her duties. She was born at Grain Lake, Sask., of Russian parents. Her maiden name was Grunin.

CAPTAIN GORDON LUNAN

This man, a captain in the Canadian Army, on loan to the War-Time Information Board, now the Canadian Information Service, was the head of a group of agents acting under the personal direction of Lieutenant Colonel Rogov. In the course of his own particular duties with the information board, no secret information came to him, but he was the intermediary through whom the information furnished by the group reached Rogov, which information was, in our opinion, furnished and transmitted in violation of the statutory provisions already referred to.

The members of the group headed by Lunan were scientists employed by the National Research Council and the Department of National Defense, research division, and their concern under Lunan, was to obtain for Rogov information on technical matters in connection with the work of those agencies. Some of the information obtained and transmitted to Rogov related to the latest developments in radar. Through this group also secret documents in the library of the National Research Council were handed over. He was born in Scotland.

EDWARD WILFRED MAZERALL

He is an electrical engineer in the National Research Council working in the field of radar, who also had taken an oath of secrecy. He was one of the group headed by Lunan and he furnished to the latter on one occasion, for transmission by the latter, two reports of the National Research Council on certain developments actual and projected, in the field of radar, at a time when the disclosure of these documents was still unauthorized. The fact that these reports were shortly thereafter presented to the Third Commonwealth and Empire Conference on Radio for Civil Aviation should be considered as an extenuating circumstance in Mazerall's favor. Mazerall is described as a New Brunswick-born Canadian of a Canadian father and an English mother.

KATHLEEN MARY WILLSSHER

She was employed in the office of the high commissioner for the United Kingdom as deputy registrar, having subscribed to a document in which she acknowledged having read the official secrets act of the United Kingdom. She had access to practically all secret documents in that office and made disclosure

of the contents of some secret documents from that office.

In our final report we shall deal with the evidence and our findings with regard to the above named persons. Each of these persons has given evidence before us and has admitted the substance of the above. To each, in accordance with the provisions of Sections 12 and 13 of the Inquiries Act, R. S. C., Cap. 99, an opportunity was given to have counsel, but none desired to be represented by counsel or to adduce any evidence in addition to his or her own testimony.

We propose from time to time, as circumstances permit, to make further interim reports before reporting finally. We are reporting now with regard to the above named persons as we have concluded our investigation as to their part in the activities mentioned, and we have been assured by commission counsel that they have no further evidence to offer which can affect the opinion we have formed on the evidence regarding these persons.

As already pointed out, we have been able to review the complete activities of four only of the agents used by the officer of the Soviet Embassy. The evidence indicates that, in addition, many other agents were active and that information more intrinsically important has been disclosed. We are not, however, as yet in a position to report with regard thereto, as the evidence has not been fully developed.

AMERICAN SURVEY

Political Scientists

(From Our Washington Correspondent)

BEFORE August 6, 1945, the purity of the natural scientists of the United States was practically subject to laboratory demonstration; at least most of them rarely came out of their laboratories. The market place, it is true, was filled with the applications of their discoveries—the pushing and jostling of its daily scene was in the final analysis largely the result of their doings. But they rarely recognised, and practically never accepted, any responsibility for what went on.

Among explanations for this state of affairs, an accurate, if at the same time charitable, view holds that the specialisation required to penetrate the mysteries of matter leaves no leisure for human affairs. The world of economics and politics, whose subjects have minds and perversities of their own, has seemed wholly alien to the world of the natural sciences, whose objects of interest do not talk back; hence excursions into the social unknown have appeared to the natural scientists as neither necessary nor pertinent.

A less charitable, though perhaps still accurate, view emphasises the relief with which pure scientists have hitherto welcomed the possibility of staying remote from the market place. In part this may have been a matter of temperament—the qualities of a salesman are not normally to be confused with those of a researcher. But in part it may have been evidence that the scientist was less innocent of the affairs of this world than had been popularly supposed. The lonely genius keeping vigil by a Bunsen burner in an otherwise unheated attic is not a typical picture of modern invention. Highly capitalised establishments, where complicated equipment is handled by teams of researchers under a director responsible to the board of a corporation or a university, is a truer picture. And awareness of, or concern about, social significance has not normally been an asset to pure science in securing budgetary allocations or foundation grants.

This background of real or studied innocence makes all the more remarkable the work of public education and political persuasion that the atomic scientists of the United States have undertaken this past autumn and winter.

A seasoned newspaperman, head of a Washington bureau, whose professional lot has been to cover political conventions, caucuses and Serious Sessions in smoke-filled back rooms, visited one of the atomic energy laboratories in the early autumn, and returned amazed at the maturity of the political discussion which seemed to be the chief concern of the natural scientists assembled there.

Within a month after the close of the war spontaneous associations were formed by the scientists of four main centres—Columbia, the University of Chicago, Los Alamos and Oak Ridge. At Oak Ridge separate organisations, reflecting the watertight divisions imposed by wartime security measures, were originally set up in the research laboratory and the two plants at work on

different processes. In November these representatives of the "Manhattan Project" merged as the Federation of Atomic Scientists; a further merger with organisations from the rocket, radar and other fields was completed on December 8th—the Federation of American Scientists.

The constitution adopted at the final merger represents so revolutionary a departure from the position of American science in the past as to merit full quotation of the preamble:

The Federation of American Scientists is formed to meet the increasingly apparent responsibility of scientists in promoting the welfare of mankind and the achievement of a stable world peace.

The value of science to civilisation has never been more clear, nor have the dangers of its misuse been greater.

The Federation is concerned with so placing science in the national life that it may make the maximum contribution to the welfare of the people.

The need for a more active political role of the scientist has been brought into sharp focus by the atomic bomb. An immediate concern of the Federation must therefore be the problem of atomic energy.

We therefore hold these aims:

1. In the particular field of atomic energy, to urge that the United States help initiate and perpetuate an effective and workable system of world control based on full co-operation among all nations.
2. In consideration of the broad responsibility of scientists to-day, to study the implications of any scientific developments which may involve hazards to enduring peace and the safety of mankind.
3. To counter misinformation with scientific fact and, especially, to disseminate those facts necessary for intelligent conclusions concerning the social implications of new knowledge in science.
4. To safeguard the spirit of free inquiry and free interchange of information without which science cannot flourish.
5. To promote those public policies which will secure the benefits of science to the general welfare.
6. To strengthen the international co-operation traditional among scientists and to extend its spirit to a wider field.

We shall endeavour to keep our members informed on legislative proposals and political developments which affect the realisation of our aims, and to co-operate with other organisations in the achievement of these aims.

In the pursuit of these objectives, the young scientists have been concentrating on testimony before Congress on the various Bills regarding the control of atomic energy. (The word "young" is important. Most of the men, and many of the top men, who worked on the Manhattan Project were remarkably young, and there has been a recognisable division between their sense of urgency with regard to the implications of what they did and that of some of their colleagues whose reputations had already been established before the war.)

Down the centuries the impact of new truth on society is sometimes crystallised in a series of particularly dramatic scenes. This time the set used for the drama was a committee room in the Capitol at Washington; the occasion, Congressional hearings on atomic energy control. But the characters were familiar: The questioning of Pilate; the testimony of Galileo; the recoil of Canute. So, in essence, were their lines: the mixture of question and inquisition in what was asked; the replies that would not compromise with the questioners' implications.

In the raised seats of the governors sat the representatives of society as it is. One question was the question of the honest layman; a second was the inquiry of the would-be capitaliser on the new knowledge; a third displayed the self-assurance of the stupid; a fourth purveyed the second-hand information of the stooge; a fifth reflected the horror of the well-established at a threatening change.

"AMERICAN SURVEY" is the product of co-operation between the editorial staffs of *The Economist* in London and Washington, a number of permanent correspondents in the United States and a wider circle of occasional American contributors. All articles or notes received from the United States are printed as "From Our Correspondent" or "From A Correspondent," the former phrase being used to identify permanent correspondents. All items not so attributed are prepared in London.

On the witness stand a succession of scientists explained, warned, affirmed: some of them captiously, some of them pedantically, some of them with the surgical precision of the learned knife.

On November 1, 1945, the Federation of Atomic Scientists declared: "We must educate every citizen to the realisation that (1) there can be no secret; (2) there can be no defence; and (3) there must be world control." Specifically, their objective has been to lighten civilian ignorance, and to modify the attitude of military authorities—in particular, to loosen the closeness with which the Army has held the power of decision over the atomic potential of the United States, not only during but since the end of hostilities. This policy has included even the civilian employees of the War Department, and has enabled Army representatives to offer their own testimony while deciding how much may be released of statements made by civilians.

Shortly after Congress convened, the May-Johnson Bill was introduced, providing for the domestic control of atomic energy, and, in fact, proposing the continuation of practically the same security measures that had been in force during the war.

The scientists urged that such regulations would mean that the abler investigators would abandon a field of research where their freedom to declare their findings was denied. As a result, the country would be certain to lose its present pre-eminence in atomic science. Their persuasiveness was one of the major factors in the appointment of a Special Committee on Atomic Energy by the Senate, whose chairman, Senator McMahon, introduced at the end of December a Bill for the development and control of atomic energy much closer than the May-Johnson Bill to the requirements that the scientists' testimony proposed.

Beyond the committee rooms of Washington, too, the change in the mood of public opinion between September 22nd when President Truman, at a Press conference, intimated a policy of secrecy and November 15th, when the Truman-Attlee-King declaration proposed establishment of a UNO commission on atomic energy is a fair measure of the scientists' efforts. That the popular concept of a scientific secret has been so thoroughly eroded is largely due to the steady flow of testimony by scientists who, having made the bomb, thought they should have some concern for what was done with it.

American Notes

The Loan in Congress

None too soon, Mr Truman has sent the text of the financial agreement with Britain for the consideration and approval of Congress. In urging prompt action in his accompanying message, it is said the President wishes to have the Agreement signed before the first meeting of the Bretton Woods International Bank and Fund at Savannah early in March. With such a need to hurry, it is the more surprising that the President's message broke so little new ground, and repeated much the same arguments as those already used by Mr Vinson and Mr Acheson in public speeches. Since opposition in Congress is likely to cast more doubt on Britain's need, and on the conditions which could reasonably be asked than on the benefits to the United States, Mr. Truman's message seems singularly unaware of what the Administration is up against. Even with the minimum of delay and the least complicated procedure there is no time to lose.

It is unfortunate that the price of getting the Senate to discuss the loan will probably be the abandonment of a measure to establish a fair Employment Practice Committee, against which the Southern Democrats are now involved in a two-week-old filibuster. Otherwise, the filibuster will go on, and the loan and the pile of urgent legislation now shelved will be kept waiting. Two interruptions only have so far been allowed by the filibusters—one for the President's message on the state of the Union and another for a speech by Mr Tydings, of Maryland, who apparently believes an atomic war can only be prevented by an immediate world disarmament conference. The necessary unanimous vote for interruption to consider the loan was prevented by a single vote, that of Senator Langer, of North Dakota.

The anachronism of this legislative manoeuvre is said to have

produced a "wave of disgust" throughout the country. But the Bible-reading, backwards and forwards, and the anti-Negro and anti-Semitic speeches go on. The Journal, a record of the previous day usually dispensed with, is now carefully read for correction, word by word, comma by comma. Since this reading can be made to occupy several hours, it relieves the filibuster ringleaders of some of their burden. Mr. Eastland, Democrat of Mississippi, threatens to talk "for two years if necessary," and his colleague, Mr Bilbo, will make two speeches, each lasting 30 days.

Many Senators, including the Majority leader, Mr Barkley, are pressing for signatures of two-thirds of the members to a cloture petition, to limit debate. The conflict here is whether to displace the FEPC Bill, which would be a victory for the filibuster, or to follow the lead of those Senators who are calling for all-night sessions, or any other means, to break the filibuster, force a vote on the FEPC, and get on with other business.

As always during a filibuster, there is a revival of interest in the need for reorganising Congress and the machinery which permits a small group of men to frustrate the action of the entire body.

* * *

Strategic Islands

The disclosure that Mr. Roosevelt at Yalta promised American support for Soviet claims to the Kurile Islands and the southern half of Sakhalin seems to be precisely what the Republicans have been looking for. They have not had notable success thus far in their attempts to prove that the late President manoeuvred the United States into war with Japan. But here is a chance to play on the American reverence, often unreasonable in times of war, for "open covenants openly arrived at." And if that line does not work with its usual magic, they can be expected to insist, whether or not there is a strategic or historical justification for such insistence, that US bases in the Pacific have the same status in relation to the United States and the Security Council as the Kuriles will have in relation to the Soviet Union, if the promised American support for Soviet claims bears fruit at the final peace conference settlement. This would mean a strengthening of demands that islands which the US military consider strategic should lie outside the supervision of the Security Council, not even subject to the curiously designed trusteeship Mr Truman has indicated he will demand.

The sequence, apparently, is that in February 11, after Mr Byrnes had left Yalta, an agreement was reached by the Big Three. The secret of the agreement, justified for military reasons at the time, was so well kept that last June, when the storm over UNO voting had not yet blown over in the United States, even Mr Stettinius, then Secretary of State, stated unequivocally that no secret agreements were made at Yalta. As late as September, when military reasons no longer existed, Mr Byrnes said the United States would oppose the Soviet claims, and now Mr Acheson, Acting Secretary of State, has been involved in a public controversy with the Soviet News Agency, Tass, because he told newsmen at a press conference on January 22nd that the Yalta agreement granted the Soviet Union the right to occupy the islands, but said nothing about a final transfer.

Irrespective of the justice of comparisons between Russian and American claims in the Pacific, the use of trusteeships as a political snowball in the United States will not help bring about a wise solution. This would appear to be still another example of the lack of liaison in the State Department about which delegates to UNO are reported to have voiced complaints. Mr Byrnes, it is said, "holds his cards so close to his chest that no one can see even the backs of them." In this case, however, Mr Byrnes himself was a victim of too much secrecy.

* * *

Mr Stassen Emerges

Mr Stassen, former Governor of Minnesota and three months out of the Navy, is, in his own words, "re-entering active Republican affairs." And the Republicans, if they would but loosen themselves from the grip of what Mr Morse, Senator from Oregon, who wants to "liberalise" the party, calls the "Ohio Gang," would probably need look no further for their man of 1948. The "Ohio Gang," led by Mr Taft, of Ohio, can, however, see no further than Mr Bricker, of Ohio.

Mr Stassen made two addresses last week, both, perhaps significantly, to women's groups—the Women's National Republican Club and the Women's National Press Club. Besides tell-



HAROLD CLAYTON UREY



HARLOW SHAPLEY



EDWARD UHLER CONDON

The Scientific Irregulars

DR. UREY, born in Indiana, started as a biologist, switched to chemistry in World War I, and in 1934 drew the top Willard Gibbs Medal and Nobel Prize for the isolation of "heavy hydrogen"—research landmark in chemistry and nuclear physics. In the late war he headed the Columbia University project on the atomic bomb. Says he in support of a science foundation: "We are strong on application and weak in fundamental science."

DR. CONDON, new Director of the National Bureau of Standards, came out of Alamogordo, New Mexico, to teach physics at Princeton, do basic work in nuclear physics and microwave engineering, and serve eight years as associate director of Westinghouse Research Laboratories. Says he: "We must regain for all scientists that freedom from military domination which is so necessary if science is to be used for peaceful ends."

DR. SHAPLEY, born in Missouri of old New England stock, holds most of the world's medals in astronomy as head of the Harvard Observatory. He joined Urey in pressing for liberal science legislation and new blood. "The scientists should, as rapidly as possible, consider themselves, if we cannot register ourselves, as citizens of the world and not the citizens of individual countries."

DR. SZILARD, co-worker with Fermi, was among the first to suggest an atomic bomb and get the proposal to Roosevelt. A Hungarian physicist, he is vocal for science's freedom from the military and for internationalization of atomic energy. He sparks the Federation of American Scientists, below, says: "Scientists now belong to the world, not the world to scientists."



LEO SZILARD

W. A. HIGINBOTHAM (insert) is a young atomic physicist and Chairman of the Federation of American Scientists, which for seven months has lobbied and propagandized to kill military control of atomic energy, force a liberal and international view into atomic legislation.

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|-------------------|----------------|-----------------|--------------|
| H. C. WOLF | W. E. STEPHENS | J. ROSENBERG | J. L. WATERS |
| R. E. CONNICK | R. GODFREY | MRS. R. GODFREY | |
| S. G. ENGLISH | A. JAFFEY | M. AMRINE | |
| J. H. RUSH | H. R. HENZE | M. PHILLIPS | J. H. MANLEY |
| L. E. MARCHI | R. MEIJER | W. FURRY | A. ROBERTS |
| W. A. HIGINBOTHAM | | | P. HAMILTON |
| | | | E. MONTROLL |



The F.A.S. high command (in session above) is young, fiery, represents some seventeen chapters from New York to Los Alamos.

6.)

1946

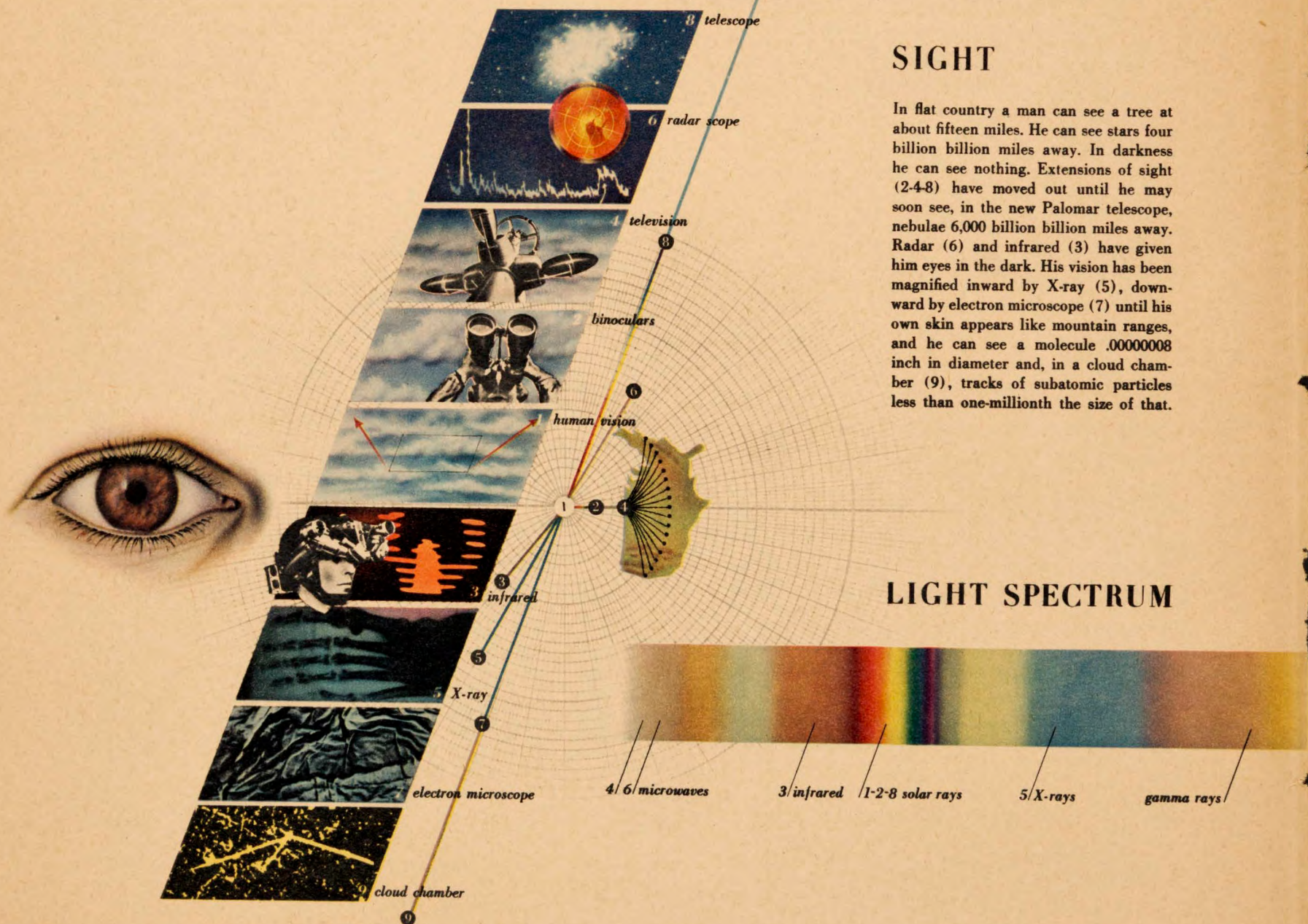
Part of a Balance Sheet on Three Centuries of Scientific Revolution

The heavy, level line that runs through the center of these graphs is the level upon which prescientific man moved and had his being. He has been aptly described as "the horizon-walking man." On a clear day his vision could just reach the horizon and barely discern any details there. On a still night his ears might detect a loud sound as much as ten miles away. Almost any day his movements were bounded by the horizon, the distance he might conveniently walk in a day. Within that magic circle, through the long centuries he built himself a slow, settled, and toilsome life, rich in inner meanings as he was constantly being thrown in upon himself.

Here and there an intrepid explorer or band of adventurers appeared, and from dim time a few inquisitive priests poked crude instruments at the stars. But for the common man nothing happened until, out of the strange fermentation of the late Renaissance, upon the bare foundations laid down and lost by the naturalistic Greeks, there was reared the beginning of modern experimental science. In five centuries this new exploration of nature has extended man's vision

far out in space and deep into the matrix of matter; has carried his voice at one swoop around the earth and given him ears above and below the range of human hearing; has set him in motion to such an extent that his latest vehicles are about to pass the speed of sound. These extensions of sight, sound, and mobility are the major cornerstones of the new world.

Whether it is to be a better or worse world than the old is for the philosophers and teachers to decide. It is a profoundly changed world, and cannot be met except in terms of that change. From the old spirit of man come such famous outcries as Flaubert's, uttered too soon in the last century: "You do not possess Christianity any more. What do you possess? Railroads, factories, chemists, mathematicians. Yes, the body fares better, the flesh does not suffer so much, but the heart continues to bleed . . . And as you have not filled that eternal yawning gulf which every man carries in himself, I mock at your efforts, and laugh at your miserable sciences which are not worth a straw." But gulfs are not filled with cries; they await bridgebuilders.



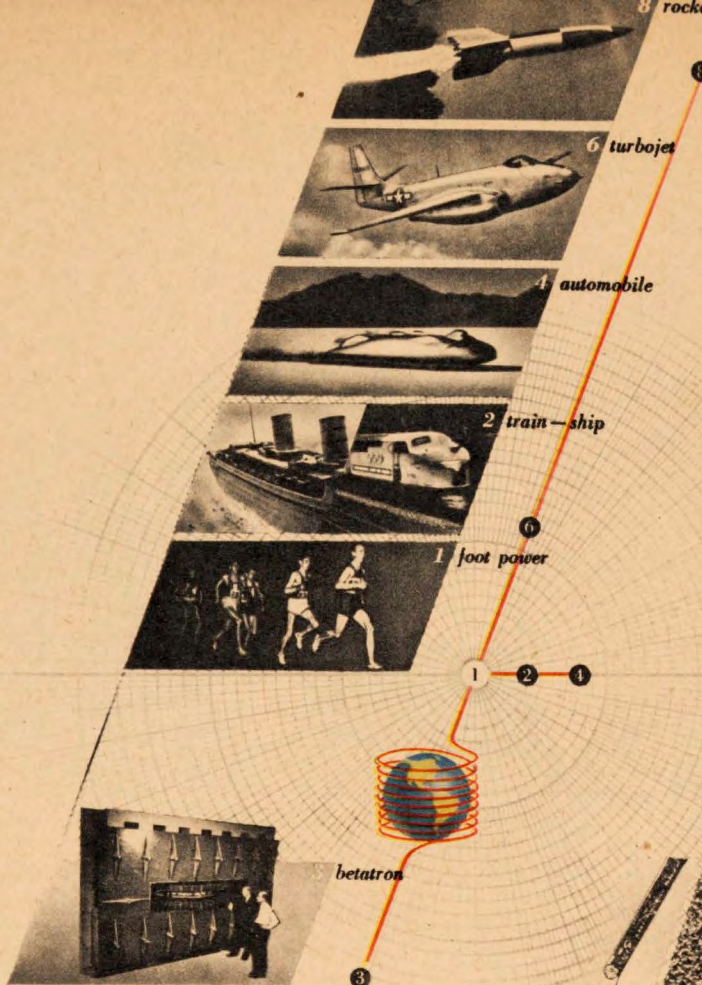
SIGHT

In flat country a man can see a tree at about fifteen miles. He can see stars four billion billion miles away. In darkness he can see nothing. Extensions of sight (2-4-8) have moved out until he may soon see, in the new Palomar telescope, nebulae 6,000 billion billion miles away. Radar (6) and infrared (3) have given him eyes in the dark. His vision has been magnified inward by X-ray (5), downward by electron microscope (7) until his own skin appears like mountain ranges, and he can see a molecule .00000008 inch in diameter and, in a cloud chamber (9), tracks of subatomic particles less than one-millionth the size of that.

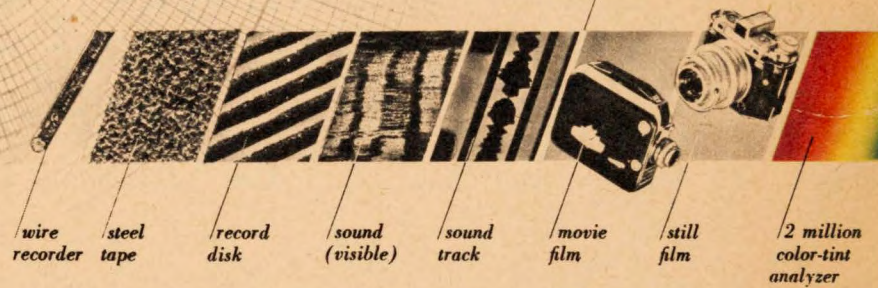
LIGHT SPECTRUM

SPEED

The fastest a man can run is 100 yards in 9.4 seconds, or 21.8 mph. On wheels, the fastest speed attained is 369.7 mph (4), three times faster than the fastest train (2). In the air, turbojets (6) have reached 606 mph and are on the way to 750 mph plus; and in the future are rocket ships (8) to exceed 3,500 mph outside the earth's atmosphere. Fastest man-made speed is the whirling of electrons in a betatron (3), an iota under the speed of light—186,284 miles per second.

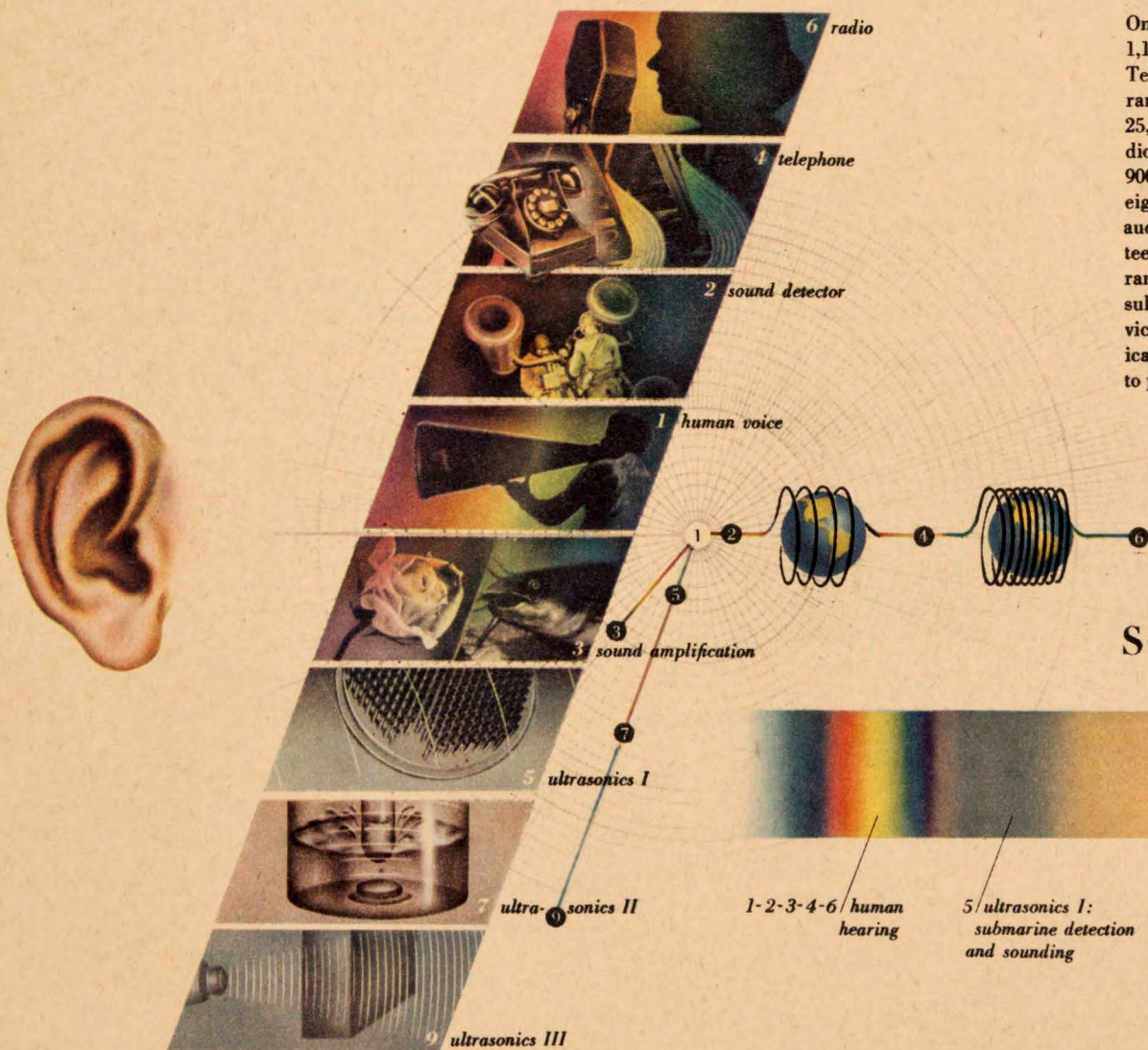


STORAGE OF SOUND / SIGHT



SOUND

On a calm day a man hears a shout 1,100 feet away in precisely one second. Telephones (4) stepped up the speed range of the voice to span continents at 25,000 to 180,000 miles per second. Radio (6) increased the speed of sound 900,000 times to circle the globe in one-eighth second. Amplifiers (3) have made audible such sounds as a fish grinding its teeth, a flower growing. Far beyond the range of ears, ultrasonics has discovered submarine-detection and sounding devices (5), sound waves to perform chemical or physical changes (7), sounds to penetrate steel deeper than X-rays (9).



SOUND SPECTRUM

1-2-3-4-6 human hearing
 5 ultrasonics I: submarine detection and sounding
 7 ultrasonics II: high-frequency chemical or physical changes
 9 ultrasonics III: ultrahigh frequency inspection of solids

Business Abroad

[Continued from page 232]

The current year has brought some relief and some disappointment. Relief came from ample petroleum imports, freeing about one-fifth of Sweden's wartime consumption of domestic fuels for other needs. On the other hand, a contract for Polish coal was a failure, and just as the first Ruhr coal shipments allocated to Sweden by the European Coal Organization were on their way, famine curtailed the German output. But Sweden may be able to pick up some coal from Britain and the U.S.—provided Mr. Lewis terminates his strike. Even without those prospects, Swedish coal stocks of a few million tons are still large enough to let the country skimp through another year.

WOOLWORTH IN GERMANY

In 1939, F. W. Woolworth Co. wrote off its investment in the German F. W. Woolworth G.m.b.H. But an enterprise is not always easy to kill. One of the oddities of the present German scene is the reopening of thirty-seven separate Woolworth stores.

The man responsible for this remarkable feat is thirty-seven-year-old Rudolf Jahn, German general manager of Woolworth G.m.b.H. since 1939. Jahn speaks excellent English and is a smooth, capable executive. He entered Woolworth as an office boy, worked in the New York office for three years, and rose with the German concern after it was formed in 1926. During the war the Luftwaffe requisitioned the main building of the firm and blew it up just before American troops arrived. Under Jahn's direction, Woolworth stores now are trying to dig themselves out of the rubble of German towns and cities.

FORTUNE's Berlin correspondent, who visited one of the shops, writes: "It is located in a temporarily rebuilt store and is confined to a single large room. The sign posted on the door reflects the current atmosphere of Berlin. It reads: 'Licensed shop. Looters will be shot!' With the exception of a few hardware odds and ends and some paper products like post cards and calendars, the merchandise is very shoddy: cheap cardboard toys and games, used-letter files, horrible nail polish costing two marks for a small bottle, and ersatz eau de cologne. There was considerable interest in paper and artificial-leather inner shoe soles. The cash registers clanged steadily."

Woolworth G.m.b.H. has shrunk greatly. It now employs 700 as against 6,500 in 1939. But Jahn believes the chain has a chance of regaining some of its prewar prosperity. His stores are showing profits that are being plowed back into the business. The British and Americans have granted him access to German Woolworth funds. But accounts in the Russian zone are still frozen. More serious still is the fact that factories in Saxony and Thuringia, which used to supply much merchandise, must now deliver 90 per cent of their output to the Russians as reparations. Quite a few have, of course, been seized outright.

The New York office has so far maintained a strict hands-off policy except to concur in Military Government's reappointment of Jahn as general manager. Like other investors in the pre-Hitler German economy, Woolworth hopes someday to retrieve its original \$10-million investment. At present the German chain is hardly worth additional money from the head office. Once before Woolworth watched its German branch grow into a 60 to 70-million-reichsmark business with an annual turnover of 129 million (nominally \$52 million), only to stand by helplessly as the German Government blocked the transfer of earnings. Once burnt, the company will scarcely grant financial aid to its subsidiary unless there is some chance that German funds can be transferred into dollars.



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The Great Science Debate

[Continued from page 120]

and often did refuse to see the press, gaining a reputation as a prima donna. He seemed to flourish in the secrecy and tight compartmentalization of science imposed by the military, and as time passed his gray hair grew more professionally awry, his Yankeeism and air of mystery more settled. He had his official picture taken in a crisp laboratory smock, pipe in mouth, holding up an artfully lighted measuring glass of clear liquid. This slightly Hollywoodish image of a scientist was useful on Capitol Hill, for among Dr. Bush's major duties was the job of seeing that the funds kept coming in. In this he was ably assisted by Dr. Conant of Harvard, head of NDRC and potent liaison man with British science, and by Dr. Compton, who had powerful industrial and military connections through M.I.T.

One of the minor wonders of the war was the way in which these academic administrators, grown adept at university politics and the manipulation of boards of trustees, turned their talents on Washington. Not only did "absent-minded professors" make most of the major technical advances in the war, but purely academic administrators cut some political curves that Mark Hanna would not sniff at.

FERMENT IN THE RANK AND FILE

To the rank and file of scientists the success of OSRD is explained not so much by administration as by a kind of fruitful chaos. The organism grew so big so fast, under a steady rain of government funds, that top administrators could not hope to reach down into every laboratory to instruct an investigator to halt this line of research and take up that. Thus when a researcher had a hunch that penicillin would be useful in fatal subacute bacterial endocarditis, and his committee turned his hunch down, he just went ahead and proved that in large doses over enough time it cured many cases. The more irreverent describe OSRD as a vast mechanism that more or less ran away with Dr. Bush and associates. It was set up to release the energies of the young, and this it did in great measure. With a rank and file composed of the country's leading scientists, most of the Nobel prize winners, most of the medalists, and nearly a whole up-and-coming younger generation, the body of OSRD developed a certain great momentum of its own.

Out of it came a brilliant set of younger administrators on the operational level, fresh from the laboratories. Representative of these were such men as Frederick L. Hovde, who directed the Rocket Division and went on to the presidency of Purdue University, and Dr. Lee A. DuBridge, who headed the giant M.I.T. Radiation Laboratory and is now slated for one of the top academic scientific posts in the country. Perhaps the ablest was Dr. J. Robert Oppenheimer, a quiet young research physicist of the University of California who turned into the high-powered administrator of the atomic-bomb laboratory at Los Alamos, New Mexico. Just over forty, he wielded the biggest physics laboratory in the world, with a galaxy of scientist stars and a force of some 4,500 scientists and military technicians. Associates use the word genius. The War Department credits him with "the implementation of atomic energy for military purposes." Well balanced and articulate, with an amazing range of interests, Oppenheimer contributed much of the hard thinking and most of the scientific savvy to the milestone State Department Report on International Control of Atomic Energy.

As the war closed, the rising stars began to overshadow somewhat the older OSRD hierarchy, which was as much as fifteen to twenty years removed from real laboratory work. The process was assisted by blunders. For, after showing high political acu-

men in the war and making great contributions to victory, Dr. Bush made a number of missteps. Chief among them was the counseling and support of the War Department's hated May-Johnson bill to continue the military control of atomic energy, blocking a major portion of all modern science. Only five scientists of any consequence came out for the May bill—Bush, Conant, Oppenheimer, Enrico Fermi, and Ernest O. Lawrence—and Oppenheimer and Fermi recanted in the flaming debate that followed. Bush misjudged postwar times and could not seem to reconvert from the convenient, authoritarian military liaisons he had so laboriously built up for victory. The scientists of the country, backed by democratic forces, rose in fury and smashed the May-Johnson bill—and with it went most of the confidence of the fraternity in Vannevar Bush.

To understand the fury that whipped for weeks around the writing of atomic-control legislation you have to go back and forward in time. The very base of the scientific revolution is free exploration of nature, free thought, free interchange of information—historically the first great free international confraternity of our times. To all this the even partial imposition of military controls would be the death knell. The scientists had just gone through four years of the rigid, harassing, secretive, and often stupid constrictions of military domination. The worst of these was the compartmentalization that locked them up with one small segment of a problem, kept them in the dark as to its relationships, and forbade them to talk, publish, or exchange ideas with others working on segments of the same problem or related problems. Continuance of such controls would kill science at the source, end freedom of research, and even threaten the free teaching of the laws of nature to future generations. Out of the turmoil sprang the Federation of American Scientists, another phenomenon of the war, banding some 90 per cent of Manhattan Project scientists and others, mostly the younger men, into the first working organization of U.S. scientists for political ends.

The war released great energies but imposed equally great frustrations. Science experienced an enormous revulsion at being used so fully for war and never so wholly for peace—and began to search for social action. Thus all of the smoldering animosities built up in working with the military, the impatience at being treated like subversive children, blazed up in one of the most tenacious debates of modern times. Scientists by the score quit all military-dominated projects, and the bitter after-war taste of ashes was in many mouths. Some even refused to take on any future military projects. Not only had there been no leaks in the dozens of secret weapons worked upon by OSRD, but the voluntary mobilization of scientists and their gradual coordination with the military had been more complete in the U.S. than in totalitarian Germany or feudal Japan, and was equaled only, if at all, in Russia and Britain.

One of the surprising discoveries of the war was that Germany failed fully to mobilize its basic scientists for special tasks, whether from disaffection among the scientists or overconfidence in a short war. It relied almost wholly on its engineers—a different breed in Europe, more heavily grounded in basic science than in the U.S.—and when it finally tried to organize the scientists it was too late to catch up. Japan's trouble was an almost comic-opera distrust by the military of Japanese scientists, trained largely in the U.S. Russia had an extremely broad mobilization of all science to serve the state, brilliant in some respects (medicine, rockets, tanks, cold-weather equipment), dubious in others. Britain had a smaller, more flexible

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The Great Science Debate

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system (much more mature in scientist-military relations than the U.S.), which made shining contributions in radar, atomic energy, jet propulsion, and in other directions.

THE BALANCE AND THE SOURCE

Whether the U.S. mobilization of science was 20 or 50 or 90 per cent effective is difficult to say, for there has never been anything like OSRD in the experience of this country. Secrecy and even victory may cover a multitude of sins, and OSRD's top administrators, forced to throw together a novel organization in record time, would be the last to claim perfection.

Maybe OSRD's ultradiplomatic handling of the military problems was the only way to get the job done, but some even within OSRD think that less kowtowing to the military would have produced a sharper war and less rancorous peace. OSRD was extremely late in getting its field service in operation, and there was too much rigid handing down of programs from the top and packing scientists off into laboratories to work for preconceived solutions. The British put their scientists on battleships and into the front lines to poke around firsthand for military problems, then brought them back to solve the problems by any plausible means. Rigidity was a rough spot in the U.S. program. One researcher, for instance, proposed a line of investigation on wound healing, was turned down because the program was already full, and finally found a private foundation that put up \$15,000. Thereupon OSRD offered \$75,000, and the research turned out to be fruitful.

Sometimes, indeed, OSRD missed the boat. While its small rocket-projectile and propellant program was way ahead of schedule, it was caught almost flat-footed by the German development of V-1 robombs and V-2 long-range rocket missiles. True, intelligence had given over one year's warning, and OSRD had on hand not one but three devices that in a few weeks stopped the V-1's almost cold. But no countermeasure was ever found for high-trajectory V-2's except capture of the launching sites. And OSRD developed no equivalent weapons. In 1943 it had created a Division on New Missiles. But it moved so slowly that, when the Army finally put on eleventh-hour pressure to save its face on V-weapons, OSRD couldn't be budged and the Army had to set up its own project. OSRD felt the war was practically won, anyhow, and from the start Bush had felt that such inaccurate "revenge" weapons were no proper part of our arsenal—an odd military notion to come from the outfit that developed the atomic bomb, and risky in the light of the developing accuracy of V-2's. The Army still has nothing to put in the air to rival captured V-2's.

Inertia, on a different level from the military, was a problem even within OSRD. Scientists are no more immune to it than other men. Administrators, chosen more often for their lack of vices than for their virtues, tend to be cautious. The story of the genesis of the atomic-bomb project is instructive not only for its sidelights on science administration but also for the light it throws on the sources, chances, and workings of science. To understand it you must cast your mind back to the years 1939-41, when the real threat of war was veiled to many, and the urgencies and dangers of the time were hard to sustain even among the enlightened. There never was any question that we would do the obvious things well, that the engineering, the communications, the ordinary equipment would be taken care of. The great danger was that we would not recognize the unknown, that through lack of venture we might not see what science calls the Problem of the Unrecognized Problem.

Atomic power was released from bits and pieces of pure research and an occasional towering discovery, extending over the past half-century and deriving from most of the major countries of Europe—as FORTUNE has traced it in two recent articles (March, May, 1946). Most of it was recondite matter that might plausibly have been thought to be of no earthly use to anyone—the true stuff of science—slowly accumulated by people only rarely known, as Einstein was known, outside the quiet of their own professions. The physicists met in international seminars, traded and argued ideas, published their findings abroad, yet their work hardly permeated the consciousness of the busy world. This democratic and often obscure basis of science makes it a difficult field to order. It is even more difficult to know where the next significant discoveries are coming from. Einstein was an obscure examiner in the Swiss patent office in 1905 when he postulated the famous equation, in a different context, upon which the release of atomic power depends.

By 1934, knowledge of the structure and dynamics of the atom had accumulated to such an extent that atomic power on a large scale might have been released at any time but for one of those flukes that stud science's history. Enrico Fermi, an Italian Nobel prize man, was then bombarding uranium, but, owing to some chance conditions in his experiments, was misinterpreting his results. Instead of finding that he had actually split uranium atoms almost in half, he determined that he was creating a whole new series of transuranic elements on the next few steps above uranium—which was partly true, yet puzzled the world's physicists because the whole could not be made to fit quite into the pattern of accepted nuclear behavior. Nearly fifteen years of bombarding atoms had never in the physicists' experience done more than chip the structure, shifting it a step or two up or down in the table of elements, with tiny releases of energy. So the idea of fission met resistance or went unrecognized in the inertia of the past, and no one checked and counterchecked Fermi's results. Only one lost voice in 1934, that of a German woman chemist named Noddack, suggested fission and called for more elaborate tests. It took four years for science to credit fully its own evidence and for Hahn in Germany and Meitner and Frisch in Sweden to conclude boldly that uranium had indeed been split through the core.

Everything depended on this interpretation. Without it the U.S., which had made few of the basic discoveries in nuclear physics, would never have been launched on the atomic-bomb project. Word came from Europe early in 1939 and almost broke up a quiet confab on theoretical physics in Washington, D. C. Physicists scrambled for telephones and rushed back to laboratories to substantiate the results. Fermi, by then a refugee in the U.S., and another refugee physicist, Hungarian Dr. Leo Szilard, went into feverish experiments, and Szilard summed up the potentials of atomic power and a bomb in a paper called "Instantaneous Emission of Fast Neutrons in the Interaction of Slow Neutrons with Uranium"—a title hardly likely to excite public consciousness. Fermi took the idea to the Navy, which said very interesting and keep us informed. Then from July, 1939, to March, 1940, Szilard hunted everywhere for someone to put up \$2,000 for pure graphite to experiment with the scheme of sustaining a chain reaction. Meanwhile, through the offices of Dr. Alexander Sachs, an unfrocked Russian social economist of Wall Street, and a letter from Einstein, the historic meeting (October, 1939) took place with Roosevelt—"a man of quick apperception," says Sachs. He promptly ordered the creation of an Advisory Committee on Uranium.

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The Great Science Debate

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It is certain that if it had been left to the military, no atomic-bomb project would ever have been under way in time for this war. The military mind is not particularly adapted to the grasping of intangible ideas. General Groves himself, in an unpublished interview, has given backhanded testimony to this. "Yes," he said, "I might even go so far as to say that if it hadn't been for Szilard, it would never have reached the President."

The creation of a committee did not end the fumbling. Only \$6,000 was appropriated in February, 1940, for Fermi and Szilard to start experiments at Columbia University, and there was the nagging problem of keeping even scientific administrators burning over the enormous potentials. The day after Germany took Paris in 1940 NDRC was set up, headed by Vannevar Bush, and funds began to loosen. But not with the sense of urgency that gripped the small band of physicists, now joined by Dr. Harold C. Urey, U.S. Nobel prize man, and others. Two early National Academy reports were lukewarm to pessimistic. Fermi would talk to Columbia's Dean of Graduate Faculties, a cautious man, who would in turn write to the chairman of the Uranium Committee, also a cautious man, who would pass on a pale version of the urgencies to Dr. Bush, who was somewhat skeptical to begin with. The project poked along, and was on the point of being put off to the next war, when the British came through with the conviction and some new evidence that an atomic bomb would work. In Britain the work had been going better because of a number of refugee physicists who, being aliens, were not allowed to work on military weapons and were putting all their time on "nonmilitary" uranium. Not until the day before Pearl Harbor was the atomic-bomb project made a supreme effort. Not until 1943 did Bush get around to meeting Fermi, and then the project was in the process of being passed over to the Army.

Such were the beginnings of the atomic bomb. All new ideas come into the world with great resistance, and it is an old story. But there is now enough glory for everyone in the atomic-energy project to begin to get the story straight.

TOWARD A NEW FOUNDATION

What, then, may be learned from the war and built into the peace? The discussion began early in 1942 when Senator Harley M. Kilgore, New Dealer and small-town West Virginia lawyer, opened hearings to tighten the scientific war machine and proposed legislation whose wartime stringency brought most scientists down on it in fear and anger. In 1944 Roosevelt requested and in 1945 Dr. Bush delivered a report on releasing war science for peace, continuing medical research, fructifying more cooperative scientific research in public and private institutions, and finding and developing more U.S. scientific talent—published in condensed form as a supplement to *FORTUNE*, September, 1945. Assembled by OSRD top committees, and proposing a new National Research Foundation with wide powers and federal funds, the Bush Report was the first milestone on the way to a new U.S. science policy. Meanwhile, the Kilgore hearings continued, piling up a mass of data and opinion, and various drafts of legislation appeared.

The basic agreement that emerged from the testimony of over 100 top scientists, industrialists, educators, and others, was that no agency as rigid, total, and hypertensive as OSRD could be extended permanently into peace without wrecking the scientific structure of the nation. Medical research could be extended and expanded; such successful devices as OSRD's system of research contracts with universities and other institutions could

be carried over; other techniques and experiences might be put to good use. But the task of peace was essentially different from war and required a different kind of agency. That such an agency was urgently needed was denied by only one witness, National Academy President Frank B. Jewett.

All agreed that the basic deficiency in the U.S., intensified by war, is basic research—fundamental science. To those who think the U.S. is the most scientific country in the world this may come as an incredible shock. To those who look about at the great technical proficiency and towering material achievements of the American scene and think these are science it may seem strange, yet the achievements are almost wholly engineering, technology, gadgetry. In two centuries of a free society, the U.S. contributions of great basic discoveries can be counted on the fingers of the hands. There was Ben Franklin in electricity, Joseph Henry on electrical induction, Willard Gibbs in thermodynamics (see page 117), Michelson-Morley for experiments on the speed of light, Millikan for the electrical nature of the electron, Morgan for the gene theory of heredity, Anderson for discovery of the positron, Davisson-Germer for wave properties of electrons, Condon for the theory of alpha-particle radioactivity, and Stanley for discovery of crystalline protein virus. Beyond these, it is hard to find really basic U.S. discoveries, though a good number of borderline cases exist.

In some fifty years of Nobel prize awards in physics, chemistry, and medicine, the U.S. received only twenty, against 119 for Europe and thirty-six for Germany alone. "Our spectacular development of the automobile, the airplane, and radio," observes the Bush Report, "obscures the fact that they were all based on fundamental discoveries made in nineteenth-century Europe. From Europe also came formulation of most of the laws governing the transformation of energy, the physical and chemical structure of matter, the behavior of electricity, light, and magnetism."

Well before the war U.S. basic research was dangerously diminishing in relation to the enormous expansion of applied research in the late twenties and thirties. It was a diminishing stream fed by steadily diminishing funds from private sources, once the great support of the universities and foundations. While industrial research (almost wholly applied) was increasing from \$116 million to \$240 million in the decade 1930-40, and government research (largely applied) was going from \$24 million to \$69 million, college and university research (mostly basic) increased only from \$20 million to \$31 million, and foundation research (heavily basic) actually declined from about \$5 million to \$4 million. Basic researchers were more and more shabbily supplied. It was nothing for a top researcher to do his own janitor work, peck out his own correspondence, and try to run his projects on a few hundred dollars a year.

War opened out new applications endlessly from the banked-up stores of world knowledge—almost too endlessly for the mind or society to absorb—but it froze the base of science, destroyed or dispersed many of the European ateliers, and stopped all U.S. basic research. The OSRD program gutted the basic laboratories of the country. It halted or pulled out such basic research machines as cyclotrons for pack-horse work in the atomic-bomb program. It pulled up most of the country's scientists and put them down in strange laboratories in strange fields. (U.S. scientists touring Russia in 1945 were surprised to discover the U.S.S.R. had continued much of its basic research throughout the war.) What OSRD did not do the Army finished

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TIME-LIFE *International*

The Great Science Debate

[Continued from page 240]

with a blind draft policy that clapped young scientists into uniform, often to do nothing but manual labor, and created a deficit in university degrees that by 1955 will run to about 17,000 research scientists and 150,000 top technical men. (Britain developed a careful system of exemptions for scientific and potentially scientific personnel.) The capital of all science was heavily drawn upon and not added to in five years of war.

The gravity of this situation lies in the fact that, while it is still important on the working level to distinguish sharply between pure and applied science, the distance between the two is actually growing ever shorter in time and development; the borderline already is fluid in many places, such as electronics, aerodynamics, chemical catalysis, and nuclear physics. To maintain its position in the world, therefore, the U.S. can no longer depend wholly on the drying sources of Europe but must deepen its own basic sciences. Those who think that maybe we have had enough science for a while—lumping the applied science of war with everything else—may awake someday to find the supposedly solid and massive achievements of their world vanished or vaporized in air. So the consensus of all parties to drafting of U.S. science policy was that its main drive must be to explore and expand basic science.

THROUGH BATTLE AND COMPROMISE

The battle, now composed, was over the means to that end. One camp coalesced naturally around the powerful Kilgore subcommittee, one of the half-dozen largest in Congress, with a big staff and four years' steady draft of funds. It wanted a foundation on straight administration lines, with a single scientific administrator appointed and removable by the President, division directors and committees appointed by the administrator (including a division on the social sciences), and a clear patent clause vesting all rights from all government-financed research in the government. It wanted technological development plugged as hard as basic research.

The opposing camp collected around the OSRD high command and the Bush Report. Fearing political domination, it wanted a foundation ruled by a board of top scientists and administrators serving part-time (the only way to get the best men, it argued), which would appoint its own full-time executive director. It was against the inclusion of the social sciences (agreeing that expansion of these was vital, but in a separate agency). It denounced the Kilgore patent clause as undermining the incentive system and defeating the aims of the foundation, which are not only to promote basic research but, through it, all industrial research. It leaned heavily to basic science.

There were other smaller camps and crosscurrents. Dr. Jewett, who wanted no foundation at all, inspired a bill that proposed a fifty-man committee of scientists and \$100,000 to review the need for a foundation. One or another group proposed to make science a Cabinet post. But the two main camps generated the main legislative proposals. Kilgore put in various drafts, modifying them from time to time to clarify or meet criticism. When he declined to accept an OSRD-written bill, the Bush forces moved around and found Senator Warren G. Magnuson to sponsor it—a young, progressive Democratic freshman from Washington who had sponsored a bill on cancer research, was active in wartime investigations. A meeting with Truman opened joint hearings on the bills in October, 1945.

Then ensued five months of pulling and hauling. OSRD's high command rolled up its biggest guns, led off by Drs. Bush, Conant, and Isaiah Bowman, President of Johns Hopkins,

political geographer, special adviser to the Secretary of State, and chairman-author of the important science and public welfare section of the Bush Report. The Kilgore group rallied government scientists, Administration guns like Wallace and Ickes, and such academic liberals as Drs. Urey and Harlow Shapley, the great astronomer of Harvard. Bowman organized a Committee Supporting the Bush Report, with forty-three distinguished names, including two Nobel prize men, and over 5,000 signatures. Urey and Shapley countered with a Committee for a National Science Foundation, with 200 leading scientists, five Nobel prize men, including Einstein and Fermi, and such others as Oppenheimer and Howard J. Curtis of Monsanto Chemical Co. and the Association of Oak Ridge Scientists. It had the avowed purpose of compromising the differences.

The Administration, which felt it had been misled by the Bush forces into supporting the May-Johnson bill on atomic energy, leaned to Kilgore, and many rebellious scientists, particularly such free-wheeling Midwesterners as Urey, resented a perpetuation of the frosty New England-Harvard-M.I.T. monopoly of OSRD. The American Association for the Advancement of Science leaped into the fray, as did the Independent Citizens Committee of the Arts, Sciences, and Professions, now headed by Ickes. The scientists were up to their necks in politics. At an impasse, and under growing pressure, the opposing parties were finally sat down at a table and a broadly composite bill was ironed out under the able mediation of Republican Senator Leverett Saltonstall, who happened to draw the chair that day.

Like all good compromises, S. 1850, the composite Kilgore-Magnuson bill, is claimed as a victory by both sides—though the Bush group is still pressing some opposition. Its structure, outlined on page 120, contains both a top administrator responsible to the President and a top science board advisory to the President and the administrator. It is described by OSRD as clumsy but workable, like many democratic institutions. The patent clause was strung with many exceptions to encompass OSRD's experience in bargaining out the patent problem in individual contracts. Social sciences remained in, but hedged with a clause that great care must be used and a thorough survey made before any program is adopted. National-defense research was sequestered in a special joint military-civilian division, where all military security would be confined. Altogether, it would create an agency to absorb OSRD and coordinate all federal research, explore the whole field of U.S. science, and, wherever it found research absent or lagging, contract for long-term projects in institutions over the country. Perhaps its most important aspect would be grants of scholarships and fellowships in science, widely spread, that would tend to inseminate many fields. Most of the top operating scientists of this war—Oppenheimer, Condon, Urey, Lawrence, DuBridge, Arthur Compton, and others—were recipients of Rockefeller Foundation grants after the last war, grants that are now fallen off.

The patent clause and social-science inclusion may be excised or amended by bitter-enders in Congress, but such a foundation is likely to be forced into the social sciences. It will have the problem of studying its own organism for the kind of policies, rotation of personnel, or other techniques it must develop to prevent the ossification that sooner or later afflicts all academies. And it will have to study the sharper and sharper impact of science and technology upon society, never before systematically investigated under a steady flow of relevant data.

Whether the patent or social-science clauses are amended in or out, the imperatives of national defense are enough to

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The Great Science Debate

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carry the major point. The bill is already behind schedule, and science is in pandemonium. Some \$500 million a year is being proposed for the new and separate Atomic Energy Commission to continue research and atomic-bomb production. The Air Forces and other branches are plugging for big programs of their own, and the Navy has already launched an Office of Research and Inventions to spend some \$40 million a year on what it calls "basic research"—though no military bureau is ever able to keep to really basic research in its overcharged desire for applied results. U.S. industry is doubling and tripling its research facilities and expenditures—all applied research—and the competition for scientists, already short in the universities, is one of the most crucial of the day. Without a top U.S. science policy, a restraining hand, and quick repairs on the universities' deficits of teachers and graduate students, this can only further wreck the basic sciences. The foundation, which does not propose to ask for funds until it has assembled its program, is talking modestly of working up to some \$150 million a year.

OF MEN AND PHILOSOPHIES

The battle has now boiled down to what man or group will run the foundation. Dr. Bush is said to have removed himself from the running with the observation that the younger blood should take over. The top OSRD group is supposed to be looking, however, to Dr. Karl T. Compton, who has kept aloof from most of the recent wrangles, has lashed out at the military for the destruction of Japanese cyclotrons, and is a distinguished and intelligent administrator—though he is crowding sixty. The Kilgore-Administration group is eying Dr. Edward U. Condon, new National Bureau of Standards chief, with a background of teaching, research, a solid shift as a Westinghouse research director, and a down-to-earth articulateness on the side of science in recent controversies. Or any of the younger group of administrators who have come up in the war, from Oppenheimer (who has said he is uninterested) to DuBridge.

Whoever he may be, he will have to perform a great feat of balance. For the great danger and even strong possibility is that the main purpose of the foundation is the one in which it will prove weakest. In applied research the experiences of war have shown that programs can be formulated, planned, coordinated, and pushed through with stunning results. And in this the foundation can easily be most successful, with many things waiting and needing to be done. But basic research is most peculiar. It does not depend on money, though it needs money. It cannot arise from planning, though it needs planning. It lodges in the erratic and creative recesses of man's brain. No definite results guaranteed.

The sharpest distinction is expressed in one scientist's observation that for \$50 million he would take on the job of building a rocket to carry an expedition to the moon, because all the technical details are known and lying about. But he would quote no figure on developing a theory of nuclear-energy levels or why the drawing of wire alters its electrical resistance

according to no known laws. These last two are basic research, and will not come out of money alone. The right man with a slide rule and a bit of wire might get an answer for 50 cents; \$20 million might go to 200 men, with no answer forthcoming. There are thousands of subjects like these—the destiny of spiral nebulae, the properties of newly discovered subatomic particles called mesons, problems of combustion, basic problems in meteorology—in which the discovery of new laws would have re-sounding implications. The problem is how to arrive at them.

Science, like happiness and other great creative objectives of life, rarely responds to direct assault. The most wasteful way to do research is to pour \$16 million into infantile-paralysis research alone, or \$25 million into cancer alone; for, just as penicillin was discovered wholly by chance in investigating staphylococci, the real answers may lie anywhere in unrelated fields. Yet, in spite of waste, the attempt must be made. The new foundation proposes an infinitely broader fertilization of the whole field of science—and may be equally wasteful. Basic science is extremely risky. If you're not out on a limb, it isn't basic research. Yet here too the attempt must be made.

The stimulation of basic research in the sciences, therefore, comes down to those bases of society from which all creative work stems. It lies in all education, in the modes and mores of the people, in the re-creation of new yet old values.

Dr. Leo Szilard, asked to explain the great European flowering of science, said, "Leisure." The society that came to troubled birth in Europe, and nearly finished itself with its excesses, was a *mélange* of old aristocratic strains and new democratic urges, in which men of learning found freedom and honor in pursuing knowledge for no immediate practical ends. It was not a sin in Europe to be at leisure or doing "nothing" in the practical sense. In the U.S. the needs of a growing nation were forever pulling science out of the laboratories into industry, or out of pure research into administration, with all the major honors and rewards for the practical doers. To counteract this, Szilard suggests that the new foundation set whatever strict talent standards it wishes, then give to worthy young scientists \$12,000 a year for life to pursue whatever interests them, with government matching \$5,000 for every \$1,000 they spend on research. Fantastic as this may sound to practical minds, there is no doubt that some such social techniques will have to be explored by the new foundation if it is to serve its ends.

Those ends are now deeply and inextricably bound up in building the peace. Science is not going to crush anybody, if we put it to use for the proper ends and draw science into our councils. It is going to crush everybody if we don't. There is the old moral issue reappearing in new and vital form. The proper ends of science now are peace and the works of peace, freedom and the works of freedom. Sometime, in spite of everything we can do—and everything must be done that reason and good counsel turn up—we may be at war again. And then a free science will be ready to our hand, stronger than ever, strong with the strength of many million men. But now it is peace.

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Massey-Harris

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and gaskets. Nevertheless, such uncertainties do suggest some of the doubts that Massey-Harris has to resolve in planning its probable \$8 to \$10 million annual sales in Europe's peak reconstruction years.

THE POWER OF WOMEN

The Orient does not underestimate the power of women. Centuries ago it put them behind the plow. It has yet to put many tractors in front of the plows. For years China and India have probably taken less than 2 per cent of the world's farm-implement imports, and their domestic-production capacity is feeble. William Mawhinney, Massey-Harris export manager, who learned the farm-implement business as Edmonton representative, flew to Karachi, India, last November. He found administrators in the capital at Delhi preoccupied with food.

India keeps over 75 million acres in rice and about 35 million in wheat. Mr. Mawhinney figures that in the rice bowl of India, in the eastern and northern river valleys, the track-laying self-propelled combine should be able to wade in and do a good job. Some units are already on the way. The combine in one day does the equivalent of about 160 man-hours of native labor. On a custom-cutting basis, this means that a self-propelled combine, before meeting its own amortization charges, knocks a big percentage off the cost of rice harvesting. Mr. Mawhinney calculates that if only 10 per cent of all Indian cereal crops were mechanized, there would be room for 10,000 self-propelleds to do the harvesting job. And tractors will make inroads too on the age-old use of millions of bullocks in India. Massey-Harris hopes to be able to sell its new small tractor, now in experimental stages at Toronto, for the cost of six to eight bullocks—at the bullocks' present inflated price. But Massey-Harris realizes that, like many of India's consumption possibilities, such figures bear small relation to prospective sales. The estimated average national income of India is only \$23 a year per capita. Thus many of Massey-Harris' orders will probably come from the Indian government. In some regions, however, the native princes will buy implements. The Maharaja of Jodhpur for instance, one

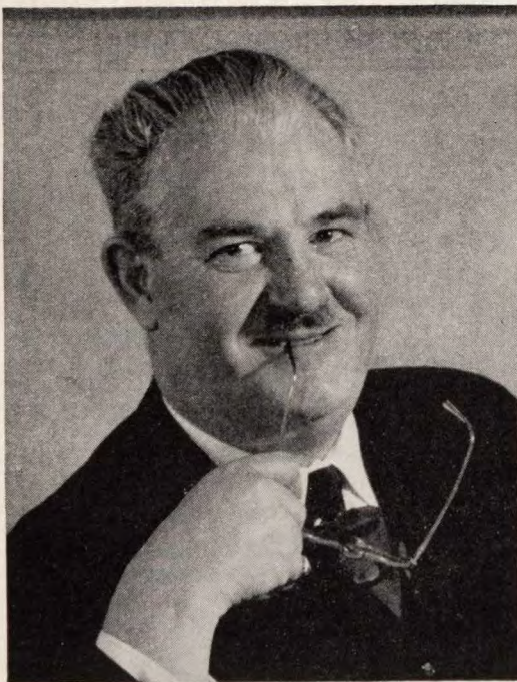
of the many potentates visited by the firm's traveler, is now using Massey-Harris equipment.

"Please send me a plow that goes by itself," wrote a native African chief to Cecil Fulton, former assistant sales manager in Calgary, who is now sales manager for Massey-Harris in South Africa. The chief also requested that his equipment be provided with at least one eye, so that it could work at night. The African jungle, of course, does not gleam nightly with Massey-Harris headlights, and orders do not arrive by tom-tom and grapevine telegraph. Mr. Fulton, however, does travel as far north as Uganda, the Belgian Congo, and Kenya Colony. The bulk of his business is in the Union of South Africa itself, where big maize farmers are kept busy feeding the native population of seven million.

The oxen with which the Boers made their great northward trek into the Transvaal are famous in South African history. The use of oxen in farming is still practiced there on a Homeric scale. Mr. Fulton reports that an Afrikaans-speaking customer of his in the Transvaal used 500 oxen as farm-work animals. He had to allot a substantial share of his acreage to feed them. This farmer bought a Massey-Harris tractor to draw his cartloads of maize, wheat, beans, and potatoes to market. Later he found that one tractor would do the work of about five span of oxen. (A span in South Africa ordinarily means from eight to sixteen of the animals hitched in a team.) Partly because the veld is being occupied by farms, thus driving up the cost of oxen maintenance, Massey-Harris can probably approach \$5 million in its busiest postwar year in South Africa.

Much of the "bread" in the Roman phrase about bread and circuses came from the Mediterranean shores of Africa and the empire soon came to depend heavily on these supplies. Grain from northwest Africa, which helped to ruin the Roman farmer, although in short supply this year, will help feed Europe this harvest season. In Oran, Algeria, a center of this French-held region, Massey-Harris has many contacts with the large growers of wheat and barley who every year send much of their crop into the

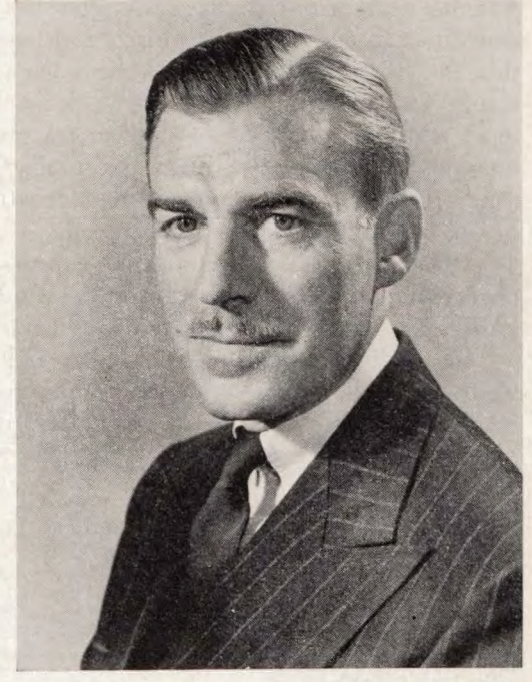
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NORMAN APPLETON, Vice President and secretary, rose through the ranks from office boy at the age of fifteen.

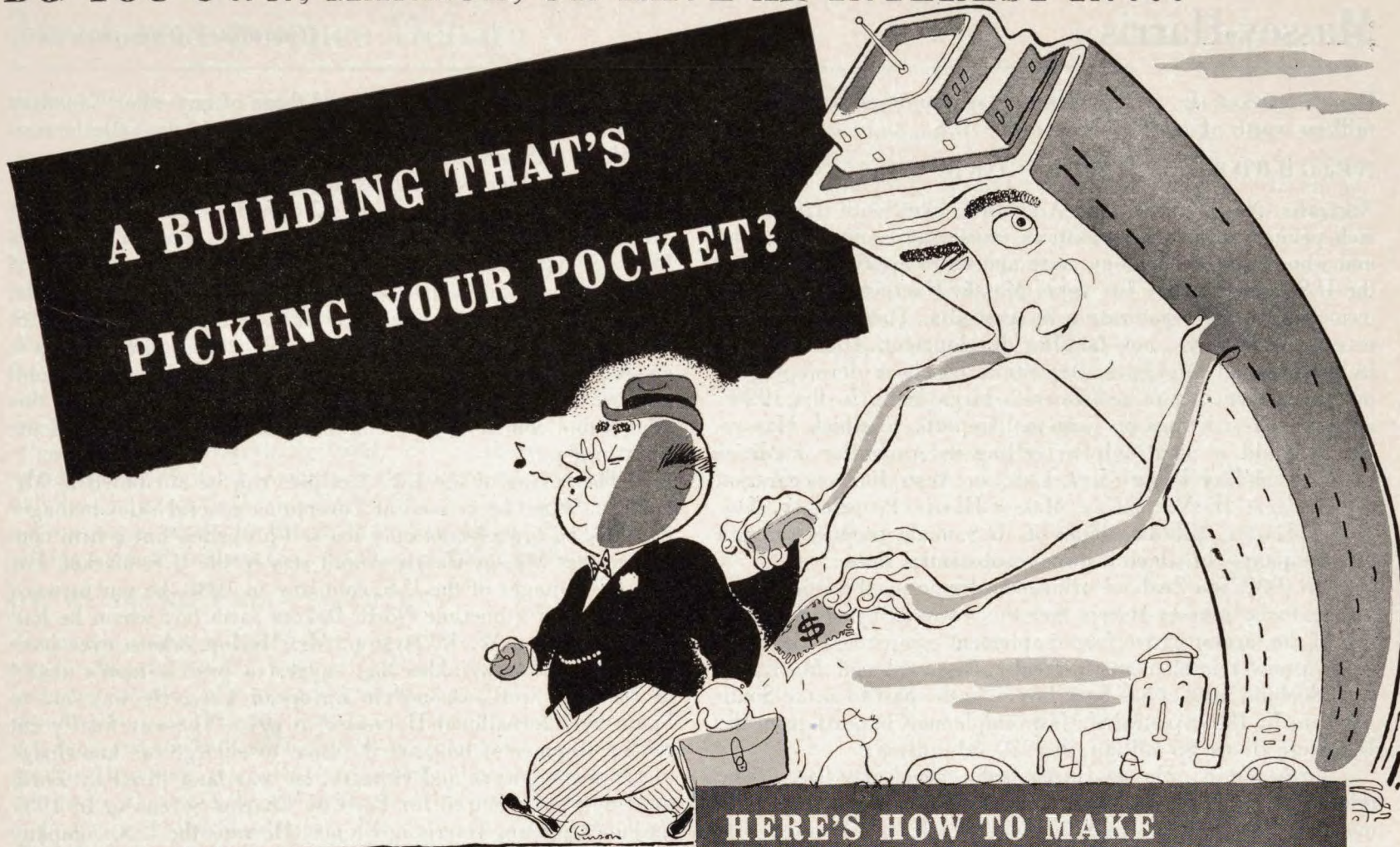


HERBERT H. BLOOM, Vice President in charge of sales, learned the business running his soldier brother's agency in World War I.



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Massey-Harris

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French market. In a big year this region imported over \$5 million worth of farm tools from the U.S.

NEIGHBORS ON CAPRICORN

Australia, New Zealand, and Argentina, like South Africa, are rich primary producing countries whose grain output is great and whose farm technology more and more approaches that of the U.S. and Canada. For years Massey-Harris maintained its own distributing organization in Australia. Then the company was challenged by a now-familiar development. Australia, like its neighbor on Capricorn, Argentina, has been developing its own manufacturing industries on a large scale. In the 1920's it slapped restrictions on farm-tool imports, to which Massey-Harris could respond only by selling its Australian facilities to H. V. McKay Proprietary, Ltd., an Australian corporation that became H. V. McKay Massey-Harris Proprietary, Ltd. Massey-Harris still distributes its U.S.-made tractors through this company—of which it owns a substantial share.

In 1938 New Zealand stringently discouraged foreign-made tillage tools. Massey-Harris met this by making a deal with one of the largest native farm-implement companies, still ships its own power implements in freely. The combined Australia-New Zealand market has been larger in the past than the South African. In 1929 Australia's farm-implement imports from the U.S. were almost \$5 million; in 1939, \$3 million.

In Argentina, Massey-Harris is the friend of a friend. The mutual friend is Great Britain, which continues to import tremendous quantities of Argentine wheat and beef. In Argentina the U.S. farm-tool companies may be tarred with the brush of recent U.S. policy toward Argentina. Since the Argentines can sell little to the U.S., they may well buy from non-U.S. suppliers if and when they can get what they need without recourse to Uncle Sam. Argentine holdings of gold and foreign exchange soared from less than 1.5 billion to nearly 4.5 billion pesos (over \$1 billion) during the war. Much of these reserves are in U.S. dollars.

Massey-Harris does not engage in discussions of such issues. It prefers to describe the Argentine market in terms of its wealth in general, and its backlog of farm-implement requirements. Demand is undoubtedly very large. In 1929 Argentina took no less than \$35 million of the total \$40-million imports of U.S. farm tools purchased by all South American countries. For several years to come, the world's demand for Argentine surpluses of wheat and other products, especially beef, will be heavy indeed. (Even grain-growing South Africa has just had to turn to the gentleman of the pampas for food.) Since long before Mr. Duncan's rediscovery of the self-propelled in Argentina, the Buenos Aires office of the company has been on the best of terms with Argentina. Today the firm's organization is headed by an active Basque named Enrique Abaroa. It is not fantastic to suggest that Argentina will buy over \$50 million worth of tools annually for several flush years. If it does, Massey-Harris should be able to do \$7 million in sales there.

DOWN IN THE STATES

The farmer in states like Iowa is perhaps the most efficient human physical-work machine in the world. Among professionals who live by their hands, the weight, bulk, dollar value, and basic social value of his product per capita are among the very highest in the world. To do his work he needs to draw on almost every technical resource of the continent's industry. In the early peacetime years, his cash will enable him to draw on it as never before. Though Massey-Harris sales in the U.S.

have never been large, they exceed those of any other Canadian manufacturer. Massey-Harris opportunities in the seller's market of the U.S. are now therefore great indeed.

Massey-Harris almost lost the opportunities in advance, in 1935, when it was tempted to sell its two U.S. plants, in Racine, Wisconsin, and Batavia, New York. If the company had, its U.S. sales effort might have been sorely handicapped. For if all of the company's machines were manufactured in Canada, their appeal would be weakened in the U.S. As it is, the U.S. farmer generally overlooks the nationalist angle because he is aware that the company manufactures a good share of its total product right in the States. He does not stop to ask whether this or that tool comes from Racine or Batavia, or from one of the Ontario plants.

The saving of the U.S. facilities can be attributed to Mr. Duncan. When he arrived at Toronto as general sales manager in 1935, he brought not only the self-propelled but a firm conviction that Massey-Harris should stay in the U.S. market. For general manager of the U.S. company in 1938, he put forward the claims of a onetime North Dakota farm boy whom he had met in Europe, W. K. Hyslop. Mr. Hyslop, whose eyes have the wheel-spoke wrinkles that suggest a prairie man's acuity of vision, is well seasoned in European ways. He was sent to Spain by International Harvester in 1914. The war finally cut off his shipments; he used the time to enlarge his knowledge of continental ways and vintages. He was later hired by Ford, fired by Ford, rehired for Ford by Charles Sorensen. In 1931 he joined Massey-Harris in France. He runs the U.S. company without much fuss and feathers. When a male worker shifted his devotions from Vulcan to Venus, Mr. Hyslop was able to save the man's job without failing to redirect his allegiance.

Mr. Hyslop has in Mr. Tucker a Vice President of extremely rich U.S. sales experience. As a young man Joe Tucker came down from the copper mines of Michigan to work for the manufacturer of a thresher. With the thresher, he went to Oliver in the merger years of the late twenties. He helped to set Oliver back on its feet in the good years of 1937 and 1938. A lean six-footer of fifty-four, Joe Tucker has a far more free-swinging style than either Mr. Duncan or Mr. Hyslop, and he uses it to good effect. His brown eyes have an air of penetration, and the plans he makes are sweeping but simple in outline.

Four aims fascinate him. The first is to correct the geographical spread of Massey-Harris distributors, lightening their relative weight in the Far West, bunching them around the Iowa-Ohio axis, and increasing their ratio in the rich farm counties of the East. His second aim is to push his advantage in self-propulsion. In the West he expects to sell a good many of his big combines. In the Midwest and East he expects to do well with the Clipper Combine, a smaller version of the same machine. The Clipper can harvest Pennsylvania wheat, Ohio soybeans, and many another eastern crop sown on smaller acreage than the huge farms of the West. His third target is the U.S. tractor market. Massey-Harris has been notably weak in the field. The seller's—or perhaps, better, the deliverer's—market in tractors should make excellent pickings for Joe Tucker in the next few years.

Joe Tucker's fourth aim is his total sales-promotional effort for the company name. His Harvest Brigade was an orchestral opening flourish for that drive. The year 1937 was the first since 1929 that the U.S. subsidiary had sales of more than \$5 million. By 1945 it was apparently doing over \$12 million. In the first quarter of 1946, it was undoubtedly beyond \$5 million

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Massey-Harris

[Continued from page 248]

for the quarter. It may go far beyond \$18 million in 1946; it will hardly do less and it may do better.

The Canadian prospects of the company are based on the Canadian farmer's sizable share of an increased national income. Canadian farmers do not enjoy prices as high as those the U.S. farmer gets. Nevertheless, a market that probably runs to about 10 per cent or more of the U.S. potential is sizable. Massey-Harris has probably never done more than \$20 million a year in Canada before. It might do much better than that in the next few years. H. H. Bloom, Vice President in charge of sales in Toronto, is back from his post as wartime Administrator of Farm and Road Machinery and very much ready to go.

PREMIUMS IN VIEW

Massey-Harris' good prospects in all three of its markets—Canada, the U.S., and abroad—promise to give quite a kick to its earnings. In terms of volume, the company expects the three markets to be of approximately equal importance.

By hard drives in all three markets at the same time, the company's volume-cost strategy and its net-to-sales ratio will derive some special benefits. Thus in the logic of production and sales, it is possible to argue that the firm's new hold on the U.S. field is of basic importance to its whole program. The U.S. company recently borrowed \$5 million, partly for plant expansion, and now has a new as well as an old plant in Racine. U.S. sales will perform two valuable functions besides merely upping the turnover. They will build up the volume of the company's facilities on both sides of the border, thus reducing cost per unit. What is perhaps more important, they will correct to some degree the position in which the firm formerly found itself, of shipping more implements and components into low-priced Canada from the high-cost U.S. than it shipped in the other direction. Savings based on lower Canadian costs reach right back to raw materials themselves. The company now obtains within the dominion 82 per cent of its raw steel, 38 per cent of its motors, 53 per cent of its malleable castings, all of its pig iron and rubber tires.

Undoubtedly, competition is normally tougher for Massey-Harris in the U.S. than in its other two markets. But even if this keeps its margin on the U.S. operation down, the U.S. volume does help to create profits in the other markets. Margins are probably slightly higher in Canada than in the U.S., undoubtedly higher in the world export market than in Canada. High-volume production based in part on U.S. sales will enable Massey-Harris to ship implements to foreign markets at a sizable spread between cost and fair competitive prices.

Even Canadians themselves sometimes bring against their own industry charges that it is slow and stodgy. The resulting arguments tend to be circular. One side argues that Canada's industry, in a nation of only 12 million people, lacks the internal volume needed to manufacture and merchandise as the U.S. does. Another side argues that Canada pulls itself down by its bootstraps with its devotion to a low-cost basis of production. If some costs, including the cost of labor, were higher, they say, the domestic Canadian market might be richer. Whatever the merits of such high-level arguments, profit-seeking Massey-Harris, in both its Canadian and U.S. plants, seems to have the complex factor of labor costs well in hand. In the U.S., while other companies were on strike, Massey-Harris kept working. In Canada, the firm expects some pressure from organized labor, does not seem to doubt its ability to reach a fair bargain.

This headstart achieved by the company may not prove

to be a vivid advantage when final scores are in, a few years from now. The U.S. industry is mighty and it is mighty in most of the markets that Massey-Harris is interested in. Nevertheless, the down-to-business mood of the company's labor relations may have potent intangible values. This year at any rate, it has the effect of striking the kind of creative note that often gives tone to a corporation's whole effort.

That tone may lead the company into some very green pastures in the next year or two. Massey-Harris has thinned down its receivables, if not its inventory, since the years when both those accounts were such a balance-sheet burden. Thus whereas it used to be said of the industry that it required a dollar of working capital to do a dollar of sales, Massey-Harris as well as most other companies can do better than that today. Massey-Harris now possesses a working capital of about \$34 million. Three million dollars of that total is the net addition created by calling \$6,700,000 of an old bond issue, marketing \$10 million of a new bond issue. The new issue, being open-ended, could be used to raise still another \$10 million if the company chose. With this budget, it looks as if Massey-Harris should be able to handle easily a program aimed at sales of \$70 to \$80 million. Even in the big farm-implement business, that is not chaff.

Credits:

- Page 108—Jesse E. Hartman
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SELF-PROPELLED COMBINES HEADED WEST

MASSACHUSETTS

★ ★ ★ **IS NEARER TO THE
MAJOR POINTS OF TRADE**



Firms shipping from Massachusetts ports effect great saving in time and money. For example, Boston lowers shipper's costs because no lighterage is needed — piers are served directly by railroads and trucks. No other major port offers these economies.



Write for the ACTION booklet, "The Open Book," Massachusetts Development and Industrial Commission, 20 Somerset Street, Boston 8, Mass.

THE GO LIGHT IS ON IN MASSACHUSETTS

HEART OF NEW ENGLAND'S MASS MARKET OF EIGHT MILLION

The Boom

[Continued from page 104]

actually happened was that some auto workers took a month's vacation, Christmas shopping, hunting, fishing, or fixing things up around the house—and then quietly went to work at some high-paying temporary job in labor-short Detroit. Certainly there was much personal suffering in the strikes; the point is only that many strikes were brief vacations. How could economists chart the wish to go fishing?

Management, too, had to make mental reconversions. Management, too, was tired. The exhilaration of war production turned to discouragement. In another sense it had grown soft without competition, with one-customer business. The manager who was required to get out and compete was not notably conspicuous. Thus the lesson to be learned from a study of the past nine months is another utterly obvious thing: everything depends on the mental attitude of the U.S. people. Charts, figures, elaborate prognosis of the economic future, the money supply, the velocity of circulation, the trend of stocks—all are worthless except as they reflect the changing attitudes of the people.

If the people had wanted deeply enough or had been able to carry on into the winter and the spring at the same terrific war-work rate, American production now would be at an incredible level. But no chart pictured the mental fatigue that was the prime result of the war; no economist could have calculated by logarithms the fact that millions of Americans wanted some time off to rearrange their lives, to rest and renew themselves, to shop, to play. *Yet that has turned out to be the biggest economic factor of all in the transition.*

Since that mental attitude has been one of boom-time fever, everything has boomed; the boom has blossomed in every corner. Hardly anything was too obscure to find a ready market; prosperity has come where prosperity never was. A prime example is religion: not just scores but hundreds and hundreds of churches are debt-free for the first time in their histories. Many of them are planning more elaborate edifices when materials are available: The collection plates do not tinkle with coppers but rustle with bills; the formal burning of church mortgages is one of the commonest rites in American religion today.



1946: MINERS ON STRIKE

Many strikes were vacations; everyone wanted a rest. After six weeks John L. Lewis' striking coal miners got \$20-a-week unemployment compensation.



1946: FIGHTING FOR STEAKS

Farm prices hit a twenty-five-year peak; but the 1946 farmer is still cautious, remembering the rock-bottom prices of depression days.

The boom came early to sports and it shows no signs of leaving. The football, basketball, ice-hockey, and racing seasons in turn saw a monotonously steady succession of broken attendance records; the 1946 baseball season got off to the biggest daily crowds ever. Jacked-up prices, such as the \$100 ringside charged by Mike Jacobs for the Louis-Conn fight, seemed no deterrent. Bruce Woodcock, a visiting British heavyweight, asked wonderingly: "Doesn't anyone ever work over here?"

The profits showered as impartially as rain. Even the stamp collectors' division of the Post Office Department took in \$2,500,000—up 140 per cent from the year before. Royal pastel mink coats sold excellently at \$15,000. Mike Romanoff, the character, saying, "I always catch cold without a cane," bought another, at \$185, reported the New York *Post's* Earl Wilson. Scores of farmers in Nebraska and Oklahoma were reported buying small planes to cut down commuting time from field to field. By March 1, farm-land values, 71 per cent above the 1935-39 average, had risen as much as during the first world war. The general realty boom, it was becoming clear, was building up to the wildest on a national scale in history. Stock split-ups reached such great vogue on the stock market that the New York Exchange Governors tried to check the trend by announcing that they would favor split-ups of high-priced stocks only, those with a record of stable earnings. Nobody seemed to be going broke; no bank had failed in two years. Debutante coming-out parties were posh again; champagne fountains flowed; summer furniture and barbecue equipment for outdoor eating sold at a furious rate; sixty-five stock companies made ready for the "straw-hat" summer theatre season. Deaths from auto accidents were at a new peak; a Kentucky hog brought \$136.28. Everything, it seemed, was the biggest in history—even more crime (up 16 per cent over last year).

[Continued on page 254]



Masterpieces

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Designed to save treasured minutes for discriminating and technically-minded men of all professions.

CHRONOGRAPH (top) in 14 Kt. gold with 12 hour recorder and raised 14 Kt. gold numerals... **\$200***
In steel... **\$100***

TOURNOGRAPH (below) is a new form of chronograph created for calculating businessmen, radiomen, engineers, doctors and sportsmen.

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Mail Orders Promptly Filled

* FEDERAL TAX INCLUDED

TOURNEAU Watches

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The Boom

[Continued from page 253]

2. THE BOOM IS EVERYWHERE

"Come to California In The Fall . . ."

—CALIFORNIA CHAMBER OF COMMERCE

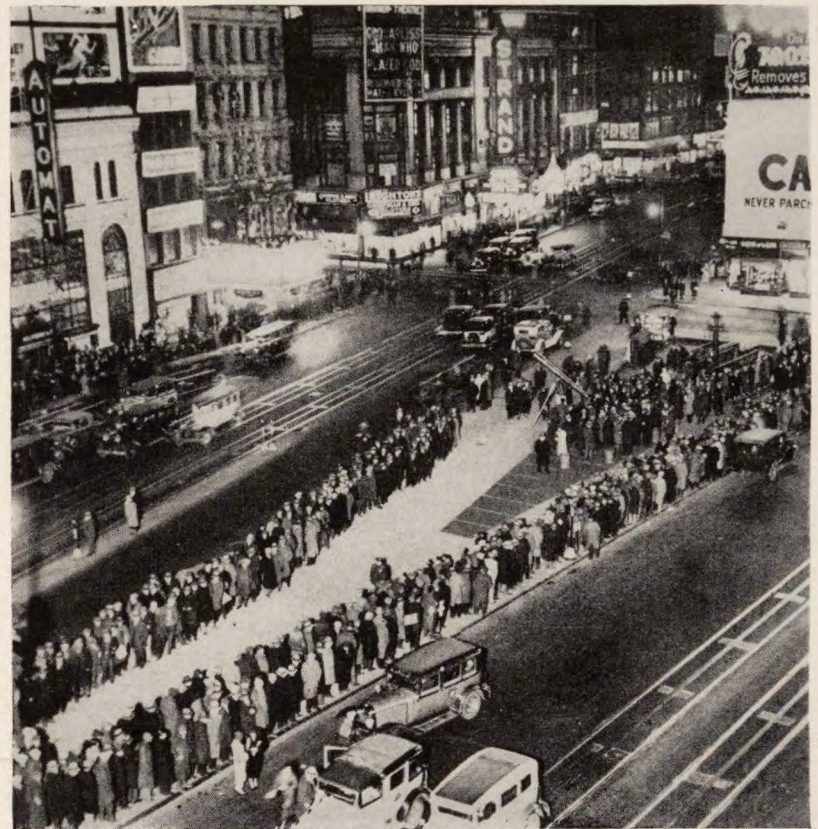
The reports from all cities and farm areas are the same the nation over; the prosperity in Seattle or Tishomingo or Louisville or Keokuk or Bangor or Duluth has the same comparative dimensions. Even the table talk in Houston and Des Moines and New York City, stripped of regionalia, is much alike, concerned mainly with shortages and prices, which are the eye-catching facets of the boom.

But this universality of prosperity has many wider meanings than the mere sameness of business vigor. One of them has the size of a new economic fact, simply that the U.S. is now physically integrated, economically unified, as it has never been.

The sectional differences, the differences between port cities and inland cities, the differences between agricultural centers and industrial centers—these were never so slight. Perhaps temporarily, the U.S. is an economic unit in a new sense. Only as recently as 1929 this was not true. Many sectors did not share the peak prosperity, and in the 1932 depression some sectors—Texas, for instance—were comparatively well off. This economic unity, wrought physically by the war with its impartial geographic apportionment of prosperity and shortages alike, is now so great that no section is economically independent in a degree comparable with 1929.

1946: SAN FRANCISCO NYLON LINE

Today every woman has the price of a pair of nylons. Cracked comedian Milton Berle: "The night-club business fell off to capacity last week."



1932: TIMES SQUARE BREAD LINE

In the depression, thousands on thousands did not even have a nickel for a cup of coffee. Hungry men marched on Washington.

In Reno (population: 28,000) a corner gasoline station, seventy feet by 140 feet, which sold a few years ago for \$22,000, was priced at \$300,000 this spring. Anywhere in the U.S. a hotel booking of less than 100 per cent brings immediate alarmed inquiries from the main office (for years 60 per cent was considered adequate; anything more was gravy). In Iowa, the savings bank in Pilot Grove (eleven houses, fifty people) had deposits of more than \$2 million. Federal tax receipts were running about \$4.3 billion above the January estimate of \$38.6 billion. In the first quarter, consumer spending was at the record rate of \$120 billion a year; the Federal Reserve Board index of production reached 169; retail-store sales were at the incredible figure of 20 per cent above the same period in 1945. About 71 million people now hold life-insurance policies. All the high-priced circus seats were snapped up; the cheapest went begging. *Variety* reported that moviegoers shunned the low-priced attractions, jammed the high-priced movies. The Florida tourist crop last winter was worth \$605 million—almost double the amount for any prewar year.

Houston was first in the nation in both the value of building permits issued and the amount of construction already under way when the federal stop order came down. Midwest farm land that sold at \$90 an acre in March, 1941, was now hard to buy at \$140. Business borrowing came up steadily: the amount of bank credit currently used is 17 per cent above last year's.

American wine producers got ready for their biggest year, planning to sell 119 million gallons, as against 1942's record 113 million. Coal-stoker sales in January were twice the previous highest January. The income of electrical utilities in the first quarter of 1946 was from 44 to 63 per cent above that of 1945. There were 243,233 General Electric stockholders, an all-time record. The best brands of French brandy sold by the case at more than \$8 per bottle.

[Continued on page 257]

The Boom

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The first \$100,000 postwar yacht was sold to Oscar Johnston, the Mississippi cotton grower, who once received the largest single annual AAA payment for not planting cotton. His boat was a seventy-footer, but it was the smallest of eight under construction in one yard. For in the yacht business there were ten buyers for each yacht that could be built. Gar Wood's 1946 motorboat capacity was booked solid, with 1947 delivery orders taken from sketches only (there were no samples) at prices from \$1,700 to \$10,000.

Decca, in the first quarter of 1945, made \$3,500,000 worth of phonograph records; in all of 1945, \$15,500,000. But in the first quarter of 1946 Decca made \$7 million and was selling seven million records a month. The piano market was estimated at 300,000 a year for several years, a figure not approached since 1909, when the popularity of player pianos sent sales to the record of 309,000.

The catalogue of the size and the universality of the Boom is actually interminable: 34 million American families with \$145 billion in savings and a \$160-billion income want to buy all they can get of eight million different things on the market.

3. THE BLACK MARKET IS THE MARKET

"At the conclusion of a ten years' war, how are we recompensed for the death of multitudes and the expense of millions but by contemplating the sudden glories of paymasters and agents, contractors and commissaries, whose equipages shine like meteors and whose palaces rise like exhalations?"

—SAMUEL JOHNSON, 1771

The black market is as clear a symbol of these times as was prohibition in the twenties. It is the perfect illustration of the truth that the buyer and the seller can always get together. The black market in meat is a letter-perfect illustration of the low-grade confusions in the American mind.

In 1939 there were 1,492 meat packers in the U.S.; this number was not substantially larger than it had been for more than twenty years. By 1946 there were 26,660 meat packers in the nation—almost twenty times as many. Meat packers, under the subsidy acts, are entitled to a subsidy of, for example, \$1.90 per live hundredweight for commercial-grade beef—yet more than 50 per cent of the 26,660 packers have not even *applied* for subsidies, probably because they would have to prove that they did not pay above-ceiling prices for their meat. One meatman grumbled truly: "All you need to be a packer nowadays is a tree, a rope, a knife, and a truck."

Surveys in a dozen cities showed that from 77 to 94 per cent of retail meat stores were violating OPA ceiling prices. One survey estimated that more than 66 per cent of all meat sold in the U.S. was sold on the black market. For many months now no American housewife has even dared to ask her butcher for the ceiling price on the meat she buys; she knows that his eyebrows will go up and that thereafter he will be fresh out of any meat she may seek. Yet many of these housewives, in sore confusion of soul, wrote their Congressmen to keep the OPA law, because "if

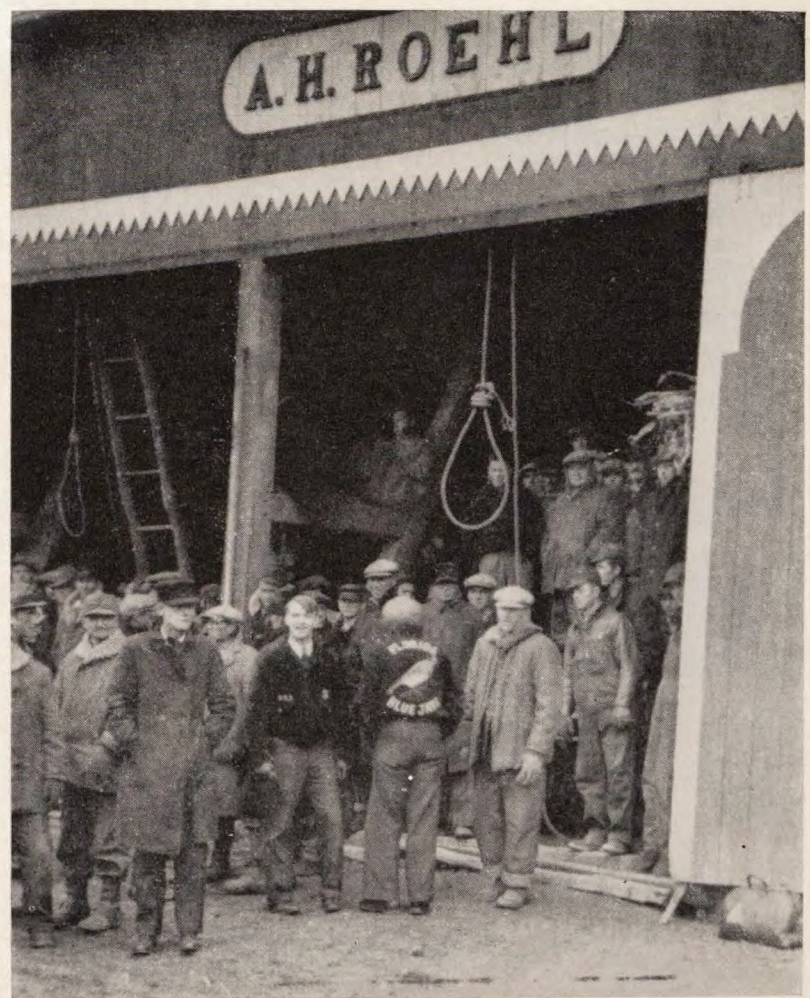


DOLLARS IN DELIRIUM TREMENS

The Lost Weekend made millions; moviemen struck gold in thrillers of suspense, suspicion, and psychiatry. Case histories of insanity became best-sellers.

1932: FIGHTING FORECLOSURE

Now farms raise dollars as fast as weeds; the depression-and-dustbowl times are only pictures in history books. No debt moratoriums are needed now.



[Continued on page 258]

Here he is now!



Johnnie Walker sets the course



Both 86.8 Proof

When good friends get together, the company is never really complete without that smoothest and mellowest of all friends—genial Johnnie Walker. To anyone who knows fine scotch whisky, the appearance of Johnnie Walker brings pleasure without parallel.



Popular Johnnie Walker can't be everywhere all the time these days. If occasionally he is "out" when you call . . . call again.

JOHNNIE WALKER

BLENDING SCOTCH WHISKY

CANADA DRY GINGER ALE, INC., New York, New York • Sole Importer

The Boom

[Continued from page 257]

the controls were taken off, meat prices would surely go up!"

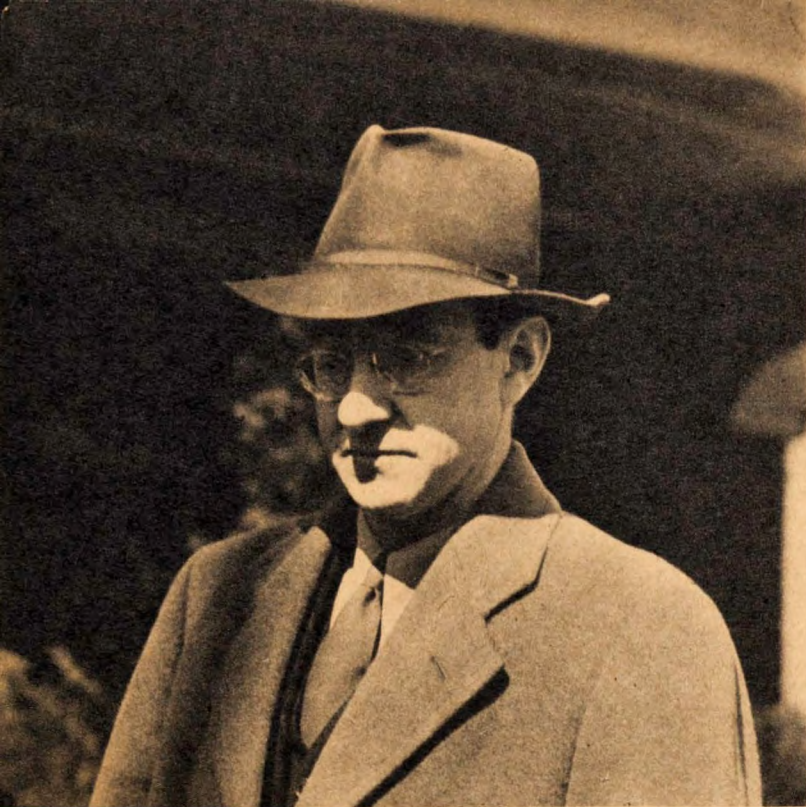
OPA pinched even the government itself; the RFC was taking heavy operational losses—which it must write off as unintended subsidies—on its Texas tin smelter, its synthetic-rubber plants, and its purchase programs from agave to zinc. (The tin smelter must sell at 52 cents a pound the tin that costs 72 cents a pound to produce.)

To buy a used car or a new car, it long ago became axiomatic that you must also buy some trifle (as a side deal for cash) without a receipt; this often is the salesman's necktie. For \$100 or so the salesman solemnly sells the necktie, and dons another for the next customer to admire. There is considerable sophistication in the variety of devices; in some cities it is customary for the would-be auto buyer to lose a \$100 bet to the salesman. The customer, for example, will say: "I'll bet that the next person who walks in here is a dwarf in a silk hat." He loses and is then permitted to buy a car. A \$50 apartment is not impossible to find if you are willing to buy \$1,500 worth of "furniture," usually consisting of a broken-down studio couch and a lamp that was obviously a bridge prize in 1925. Unsophisticated war veterans had difficulty understanding how values had changed while they were away, but there were plenty of teachers. When a hero and his bride, seeking an apartment, would eagerly stress that they were quiet and meek as tenants, that they had no dogs or children or bad habits, that they wouldn't think of complaining if all the plaster fell, and so on, the American landlord would merely shake his head and say: "You haven't said the right thing yet, bub." They either learned to say "the right thing" or they went somewhere else.

All this is black market; obviously the black market is the real market. In the U.S. in 1946, the historians will write, it was possible to get anything you could imagine—for a price. The black-market quotations were fairly level across the land, too; for \$7.50 you could get a pair of nylon stockings in any city; for \$1 to \$1.50 you could buy a pound of butter. It was said and not denied that if OPA really enforced the law, all the building-materials businessmen in Boston would be in jail. In the South, 1,250,000 pounds of black-market sugar went to the highest bidders—the moonshiners. Throughout the U.S. trucks were sold by "tie-ins": for as much as \$1,000 over the ceiling price the customer got some extra piston rings or two front fenders. Carpenters' nails were scarce, with the ceiling at \$5 a keg in twenty-five-keg lots, they were selling at two or three times the ceiling price. Carpenters were short, too; in Detroit you could not hire a carpenter at the regular rate of \$1.90 an hour unless you guaranteed him Saturday and Sunday work each weekend at double pay. The black market in farm machinery was one of the wildest: used tractors, OPA-priced at \$2,000, sold at \$3,400. Lumber got around the OPA everywhere by a variety of new grading methods; one lumber buyer grumbled: "If you can pick a board up by both ends without breaking it in the middle, it's No. 1 Select."

The black market is wrongly discussed in terms of the cops-and-robbers journalism of the prohibition era; it is a major factor in the economic scene, here to stay as long as price controls stay. It is less than idle to talk luridly about "black marketeers robbing the American people of millions of dollars." When nearly every American butcher and used-car dealer, building-materials man and lumber dealer, is a so-called "black marketeer," the crime loses stature; if every man is a criminal, none is. When none of the patriotic compulsions of war remain,

[Continued on page 260]



HENRY HANSJERGEN, assistant purchasing agent of the Cincinnati Gas & Electric Co., leaves home at 7:45 A.M.



THE OFFICE is on the ninth floor, above these Pantheonic pillars. Every working day, for nineteen years, Hansjergen has arrived at 8:00 A.M., worked until 5:00 P.M. Now his name is on the door.

902-3-4

PURCHASING & STORES
DEPARTMENT

Paul D. Crary
H. F. Hansjergen
M. S. Abbott

WHITE-COLLAR MAN

\$76 a Week • A Suburban Home • Two Weeks' Vacation • Boy Scout Hikes and the Church • Success

On five mornings a week at seven-forty-five Henry Ferdinand Hansjergen puts on his hat and coat, says goodby to his wife and two little girls, and steps out of his brick-and-stucco suburban house at 3 Crawford Avenue, Bellevue, Kentucky, just across the river from Cincinnati. He walks about one hundred yards to catch his streetcar to work, keeping carefully to the sidewalk around the edge of the lawn. The house is at the dead end of Crawford Avenue, next to the trolley tracks, and the Green Line's No. 11 car stops right there. It takes from fourteen to eighteen minutes to angle through the town of Newport, cross the Ohio on the Central Bridge, and pull into Cincinnati's Dixie Terminal. Mr. Hansjergen walks a block to the corner of Fourth and Main and at eight, or perhaps eight-five, goes past the pillars at the entrance of the Cincinnati Gas & Electric Co.'s sixteen-story office building and up in the elevator to the ninth floor.

On the ground-glass door of 902-3-4 are three names: Paul D. Crary, H. F. Hansjergen, M. S. Abbott. Mr. Crary is the purchasing agent for C.G. & E. Hansjergen and Abbott are his assistants. Crary has the corner office with two windows facing south to the river and the Kentucky hills. Hansjergen's office is next, with one window facing west. In the room are a desk, a table, three chairs, a map of Greater Cincinnati showing the extent of the 1937 flood, a Chesapeake & Ohio calendar with a

picture of Chessy the cat, and three steel bookcases full of catalogues from steel, brass, wire, lumber, and electrical-equipment companies. Hansjergen hangs up his hat and coat and is ready for the day's work. Except for an hour off for lunch at the company cafeteria or a nearby restaurant, he will be in the office until he leaves at five o'clock to catch the Green Line's No. 11 home again.

During the day he will check hundreds of orders for cable, poles, switches, transformers, wire, pipe, insulators, and supplies ("everything from soup to nuts, you might say"), and he may telephone as many as fifty supply houses to place or confirm orders. In these days of shortages it is sometimes impossible to get such things as I beams the right length or wire the right gauge. It takes a lot of shopping around, a lot of figuring on substitutes and makeshifts. There is more to being an assistant purchasing agent than just ordering sixteen-foot stringers or a gross of paper clips. He must be familiar with steel production and prices, for example; he must know the relative values of creosoted longleaf yellow pine and red cedar for utility poles; and he must, of course, know the merits of all the supply houses and mills. Hansjergen buys as much as possible in the Cincinnati area, but sometimes orders from eastern or far-western mills. He keeps track of transportation rates and routes from the mills and

This is FORTUNE's second "White-Collar Man" story. (The first—May, 1936—described the life and circumstances of an employee of the New York Telephone Co.) White-collar workers may be defined roughly as members of the salaried middle class who perform services rather than physical labor. This class has grown faster than any other segment of U.S. economy. Its numbers (about 12 million in 1940) increased 127 per cent in thirty years, while the number of industrial workers increased only 24 per cent and the number of farmers fell off 16 per

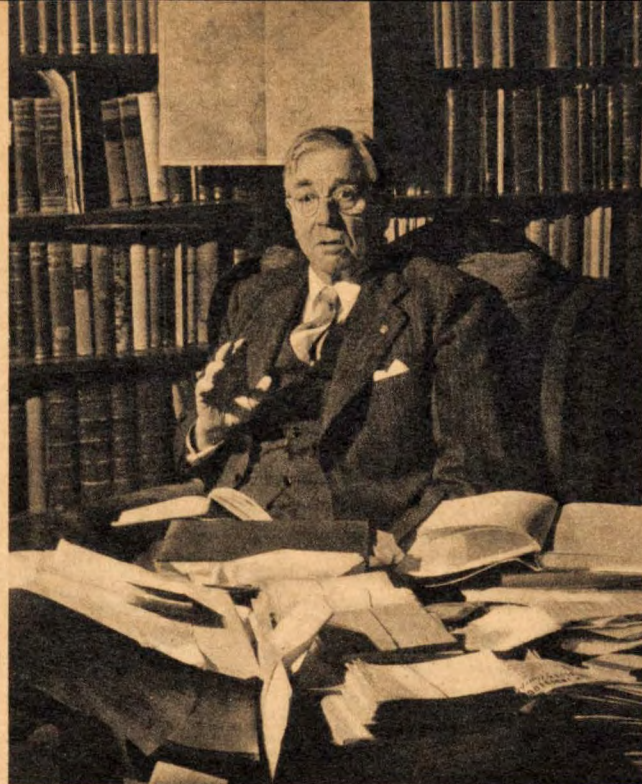
cent. During the war the acute demand for industrial workers temporarily retarded the rise of the white-collar group. Indeed, in many instances manual laborers were paid more than office workers. The average weekly earnings of factory workers rose 75.5 per cent during the war; the pay rise for salaried workers was only about half as much.

Henry Hansjergen is above the average of white-collar workers, both in job responsibility and in salary. But the story of his life, which appears here, is fairly expressive of his class.



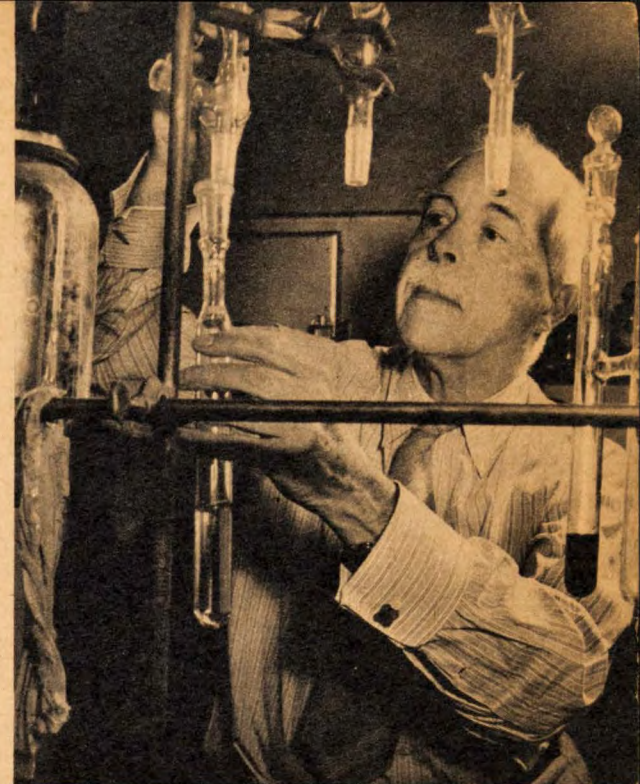
BIOLOGIST

Herbert M. Evans, Berkeley, has discovered such things as the forty-eight chromosomes in man and the fat-soluble vitamin E(x) that is essential for mammalian reproduction.



ZOOLOGIST EMERITUS

Charles A. Kofoid, Berkeley, student of parasitology and amoebiasis, is an outstanding zoologist (another, Samuel J. Holmes) in a highly distinguished department.



CHEMIST

The late Gilbert N. Lewis, great chemist and builder at Berkeley of perhaps the strongest chemistry department in the U.S., was in the forefront of the investigation of matter.

are a university's great men, which are its great departments, and which are the great universities. In rankings of this sort, California has, for the last fifteen years, come out well. Its Berkeley Library (1,500,000 volumes) is considered by many to be the third most distinguished, after the Congressional Library and Harvard's; its Los Angeles library (500,000) is perhaps the fastest growing in the world. Its faculty and its departments are of about the research caliber of Harvard's.

Research is not merely the measure of the University, it is the University's basic drive. In educational argument, members of the faculty differ widely as to the purpose of a university; in educational action, most of them agree. They are modern-day Fausts, and they are out to plunder the universe of its secrets, whether they lead to pure or applied knowledge. The University of California is a place where professors can do everything from wildcatting in chemical investigation to constructing experimental farm machinery. There is practically nothing known to man that the University does not have its research finger into:

- Plutonium was discovered on the top floor of Berkeley's Gilman Hall.

- The men in the department of geology at Los Angeles are engaged in the following projects: micropaleontological studies of rocks; continuing work in geomorphology (the shaping of the earth's surface) now being aided by observation of a new Mexican volcano, which displays erosion effects; a study of the conditions of oil formation; continuing work in opaque minerals; a study of the mechanical processes of wave erosion; an investigation of the conditions under which copper is found; a study in the Sierras of the origin of rocks.

- Paul S. Taylor, professor of economics at Berkeley, has made studies of agricultural labor that were used as a basis for the government migrant-labor-camp program. Some of the data was fictionalized in *Grapes of Wrath*.

- Institutes of Industrial Relations have just been started at Berkeley and Los Angeles.

- A few of the discoveries made at the University of California are: cyanide process for recovery of gold by Samuel B. Christie; artificial parthenogenesis by Jacques Loeb; vitamin

E(x) by Herbert M. Evans; heavy oxygen isotopes, weight 17 and 18, by William F. Giaque and Herrick L. Johnston; carbon 13, by Raymond T. Birge (with A. S. King of Mount Wilson Observatory); neptunium, element 93; plutonium, element 94; and not-yet-named element 96.

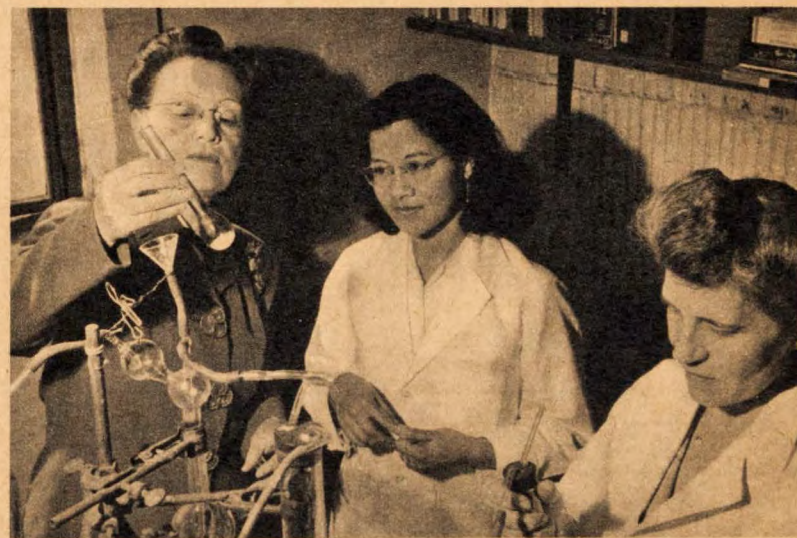
- Max S. Dunn, Los Angeles, has developed microbiological methods of determining the amino content of foods.

- The Medical Center at San Francisco has made basic discoveries on anemia, botulism, and sleeping sickness.

- For further study of the nature of the atom there will be at Berkeley not only the 184-inch cyclotron, but a variety of super-instruments of still-secret names.

- The Law School's Max Radin is internationally known for his works on legal history and Roman law. He has also written plays and published a biography of Marcus Brutus, and a popular book, *The Law and Mr. Smith*.

- Clarence M. Haring's department of veterinary science



HOME ECONOMIST

Chemist Agnes Fay Morgan, Berkeley, has turned what would seem to be an applied science into a pure one by insistence on research in foods and by her own contributions to nutrition, particularly as regards vitamins and proteins.

has studied and published pamphlets on such subjects as *Distension as a Factor in Gastro-Intestinal Diseases of Herbivores*, *Bovine Mastitis*, and *Vesicular Exanthema of Swine*.

- There are guinea pigs, rabbits, snakes, frogs, salamanders, pigeons, canaries, chickens, hamsters, monkeys, cats, dogs, and about 15,000 rats in Berkeley's Life Sciences Building. The daily birth rate of the rats varies between 300 and 500.

- In the College of Agriculture, Howard O. Essig and his entomologists have coped with 100 native and 350 introduced varieties of insects. One man in the Extension Division propagandized research findings on butterfat well enough to double the production of all Marin County cows in twenty-five years. Hans Jenny enlarged the theory of how plants feed on soils by showing that ions of plant nutriment jump from soil to root without being dissolved. Two men in the division of plant pathology have been working continually on the general nature of viruses. George H. Hart's Division of Animal Husbandry at Davis maintains sealed rooms, known as respiration chambers, for the study of the basal metabolism of cows. Harry B. Walker's Division of Agricultural Engineering has worked out

devices for actually reshaping seed so as to promote growth and to facilitate precise mechanical planting.

UNIVERSITY AND STATE

The University reflects not only U.S. intellectual life in general but the life of California in particular, simply because the people who support it, the people who run it, the people who teach in it, and most of the people who attend it are Californians. "It is," as President Daniel Coit Gilman remarked in 1872, "the university of this state. It must be adapted to the people, to their public and private schools, to their peculiar geographical position, to the requirements of their new society and their undeveloped resources."

Outside pressures are various. As on every campus in the country, the word of an influential man carries weight. What is more, real-estate groups have had much to do with the University's outward shape: the location and development of the Los Angeles campus, for instance, was part of a big real-estate deal involving, on the one hand, zoning requirements strict enough to keep students and faculty from living near the campus

[Continued on page 219]

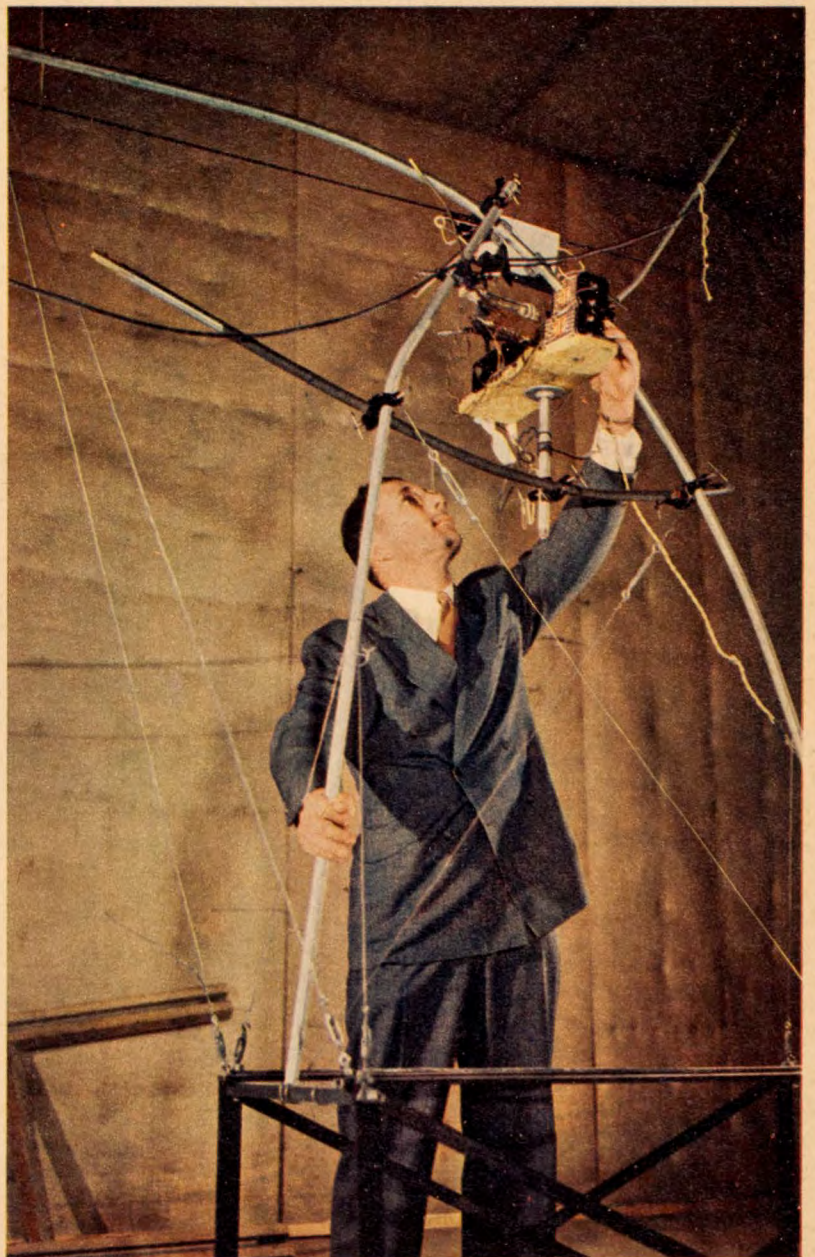
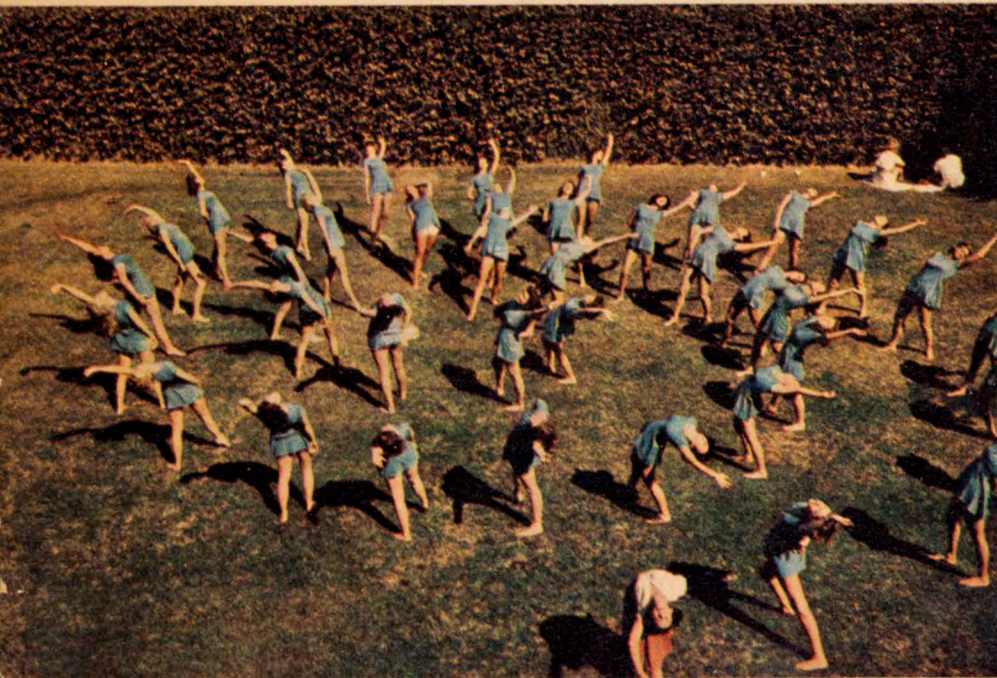
CALIFORNIA STUDENTS CAN FIND WHATEVER COURSES THEY WANT...



ART APPLIED TO CERAMICS is the enthusiasm of Los Angeles' Laura F. Andreson, who ranks high among U.S. potters. Ceramics, like textile and dress designing, is an important California industry and as such a concern of the University. Even student work attracts commercial buyers.

THE SPEED OF SOUND is recorded by Robert W. Leonard, acoustical physicist at Los Angeles. Since the campus is young, most departments have yet to win their reputation. But in acoustics Los Angeles tops the country.

DANCING FOR CREDIT is a recognized avenue of the higher education in the U.S. Gym classes at the University of California are seriously expressive.





AND THEY CAN FORGET ABOUT THEM WHEREVER THEY PLEASE



BEFORE A PROPER COPY DESK the managing editor of Berkeley's *Daily Californian* addresses underclass colleagues. Men and women in campus big business spend hours a day on such work, leave with the promise of good jobs. SOAKING UP SUN ON THE STEPS of Wheeler Hall in Berkeley is a traditional way to spend a spare ten minutes. The steps are as democratic as the University itself: both are free to any race and creed. The steps are also the locale of noisy pre-football-game rallies. SPRAWLING ON THE GRASS is everywhere a serious preoccupation of youth, but at Berkeley it is springtime all year round.



Shorts & Faces

Stock Options and Incentives

AFTER thirteen years of New Dealing, a ranking government official dared to say, out loud, that there was a certain relationship between maximum production, full employment, and the price for managerial skill. The official, Albert J. Browning, acting head of the Office of Domestic Commerce, proposed that the income-tax laws be changed to keep top-layer executives from relaxing on Florida beaches. There was no good reason for them to work harder, he believed, because high personal income taxes had limited most salaries to around \$40,000. Mr. Browning was promptly slapped down by his boss, Henry Wallace. Later, however, Mr. Wallace practically took the ball away from Browning—in a speech in Miami, Florida, Wallace advocated incentives for “not only labor, but also the salaried worker, the salesman, the engineer, and those men who make up the management staffs of American business.” The applause was loud when he said, “It may well be that we need to adjust our tax laws and policies so as to provide proper incentives for those men who are the managers . . . I believe the proper use of incentives can importantly aid in attaining the goal of full consumption as well as full production.”

The present income-tax laws not only eviscerate annual salaries but they also make it extremely difficult for an executive to buy an interest in a company out of his salary. Thus it is hard for promising concerns to lure talent away from safer or more commanding positions. This helps to foster a younger management class that not only feels no proprietary responsibility in its dealings with labor and capital but is interested only in short-term possibilities.

Traditionally, and especially during the early 1940's when income taxes became so high, corporations offered executives ownership through the stock option, which is a right to buy stock at a set price. Although widely abused, the stock option, legitimately used, served industry well until February 26, 1945. Then a Supreme Court decision upset the prevailing belief that an option, priced at the market or

above when granted and therefore having no immediate market value, was a form of incentive, and that any long-term profit made on such an option would come safely under the capital-gains tax. After an intermediary dissidence by the Tax Court recognizing the existence of an incentive option, the Treasury Department ruled on April 12 of this year that there is no such thing. All employee stock options granted since the Supreme Court decision are now considered as compensation—taxable at rates from 44 to 88 per cent when exercised, even though the stock is bought to be held. In addition, the capital-gains tax of 25 per cent applies if the stock is sold after further appreciation in value.

Unless somebody gets the Supreme Court to say that the Treasury was reading too much into its decision, Mr. Wallace's new bureau for incentives will have to find new incentives—or persuade Congress to pass a law. At the moment there is no middle ground.

Obviously, the Treasury's ruling will have a deflationary effect on much hopeful corporation largess of stock options. In 1945 at least twenty-one companies listed on the New York Stock Exchange gave or renewed rights for a

total of some 700,000 shares to 100 executives, at an aggregate option price of a little over \$11 million—equal before the February break to \$20 million at market. The biggest individual chunk was issued by American Airlines to C. R. Smith, its Chairman. Assuming that Mr. Smith doesn't have sense enough to wait for clarification of the present confusion, he could make a highly taxable \$2 million by exercising his pre-emption for 50,000 of his company's shares at \$58.50.

Tom Girdler's Consolidated Vultee gave him rights for 12,500 shares at \$22.62½ each, and gave another 96,950 at \$25 each to thirty-three other officers (present market: around \$27). Aviation Corp. granted twenty-one of its top men options for 334,000 shares, of which 90,000, carrying a half-million profit to date, are reserved for Victor Emmanuel. Also on the list of option givers are motion-picture companies and some industrials, including Continental Can, Parke Davis, Van Raalte, and Interchemical Corp.

Whatever materializes out of Secretary Wallace's research report—the latest ruling notwithstanding—may make these options worth more than the paper on which they are printed. Right now they aren't worth much.

FRANK RIEBER



A Case of "Serendipity"

ONE afternoon in 1908 a physics student at the University of California cut his classes, met with a few fellow undergraduates in a basement near the campus, and organized the Bay Counties Wireless Telegraph Association. The occasion was more auspicious than the student could possibly have guessed. During the next two decades, four of the "hams"—Lewis Clement, Harold Buttner, Haraden Pratt, and Ralph Heintz—became, respectively, engineering Vice President of the Crosley Corp., President of Federal Telecommunication Laboratories, Vice President of Mackay Radio & Telegraph Co., and Vice President of Jack & Heintz Co. The physics student himself—Frank Rieber—became one of the most successful inventors in the U.S.

[Continued on page 162]

Fortune

JUNE 1946 · VOLUME XXXIII · NUMBER 6



THE BOOM

IT'S SPENDING, SAVING, SHORTAGES, AND CONFUSION. IT'S EVERYWHERE.
AND EVERYBODY THINKS THEY KNOW WHEN IT WILL END. BUT DO THEY?

There is a rich queerness to the U.S. scene in this summer of 1946. Everything is bright and sharply visible, but the sum of it doesn't seem to make much sense. Like a surrealist landscape, it is brilliant, gaudy, carefully drawn, and yet somehow nightmarish, distorted, and spotted with irrelevancies. This is the postwar, this is the dream era, this is what everyone waited through the blackouts for; now the lights have come on but the spectacle is so vast and confusing that it is hard to understand. The U.S. is a great collection of contradictions, ironies, excesses, and shortages. Hand in hand go the grossest vulgarities and the profoundest soul-searchings. A revival of religious feeling heaves up in the middle of the age of doubt. People spend more than ever before and save more than ever before.

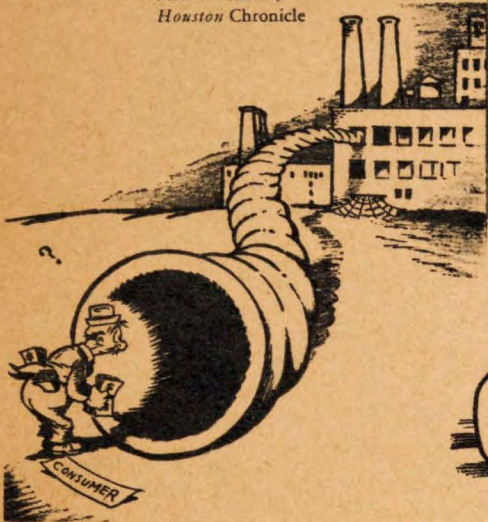
The Great American Boom is on, and there is no measuring it; the old yardsticks won't do. The people and their money behave queerly, and very humanly, which is to say contrary to the economic graphs. Most economists were caught short by the staggering retail buying boom last fall, when the sale of consumers' goods was limited only by the number of people who could get into stores and the durability of salesclerks. Government economists not only failed to foresee a shortage of labor but predicted great unemployment during the months of the reconversion period. Their charts are not charts of the U.S. people; the U.S. people are not always predictable.

So the Boom is on, the biggest in American economic history. Almost all the curves are up. The market is bull—or was when this went to press. There is a powerful, a consuming demand for everything that one can eat, wear, enjoy, burn, read, patch, dye, repair, paint, drink, see, ride, taste, smell, and rest in. The nylon line is the symbol of 1946—at any given time of day, all over the U.S., thousands of women are patiently shuffling into hosiery stores.

Throughout the nation there is at large a vast force of spending money, surging violently about the economy, like an Olympian bull in an old curiosity shop, battering its way in and out of stores and through the banks and into the stock market and off to the black market and on into the amusement industry. Everything that is made is bought up as fast as it appears. There seems to be no bottom to the demand, no bottom to the American purse. Toulouse-Lautrecs at \$30,000, mink coats at \$15,000, men's wrist watches at \$1,000—all sell just about as fast as egg beaters, table radios, and pork chops.

The Boom now under way is an abnormality, a thing far beyond such a peaceful thing as "prosperity." It is the sudden release of an unprecedented amount of money into a market unprecedentedly bare of goods. Yet this is not quite true: there are more goods than ever before, because American peacetime production is at record levels.

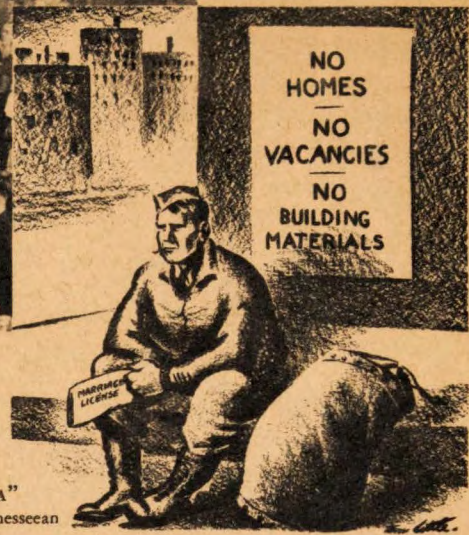
"THAT HORN OF PLENTY"
Ferman Martin,
Houston Chronicle



NIGHT CLUBS BOOMED
Jerry Cooke-Pix



"WHY IS IT THAT WE CLOSE
OUR EYES TO THINGS . . ."
Robert Osborn, New Republic



"AND I THOUGHT
IT WAS TOUGH ON OKINAWA"
Tom Little, The Nashville Tennessean

THE AMERICAN SCENE HAS THE FEVER OF BOOM



BURNING A CHURCH MORTGAGE
Courtesy Des Moines
Register and Tribune



UNCLE SAM'S NEW PANTS
John Chase,
New Orleans Item



THE NYLON LINE
Courtesy Minneapolis Daily Times



"UNLESS WE DO SOMETHING ABOUT IT"
Tom Little, The Nashville Tennessean

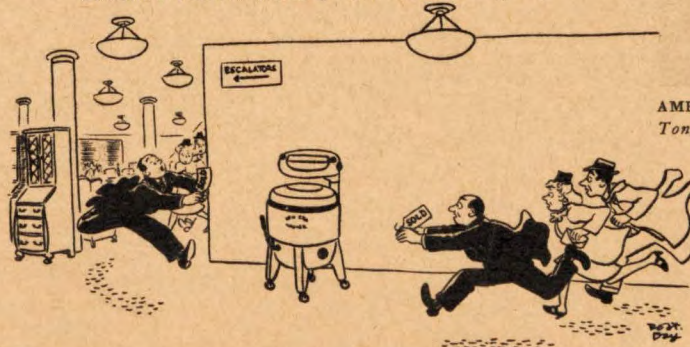
"HAD I THE FOOD YOU WASTE . . ."
Fitzpatrick
in St. Louis Post-Dispatch



CLOTHES COST MORE
RITA HAYWORTH IN GILDA
Bob Landry—Life



FIRST COME, FIRST . . .
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AMERICAN BOY: 1946
Tony Linck—Life



Is it inflation? Prices are on the rise all right. The fever is in the blood of the buyers. But is it truly inflation as long as (1) the money supply is kept under control and (2) both men and plant are still far from capacity production? For while unemployment is negligible, the peacetime U.S. industrial machine is still only warming up.

"Slogan for 1946: Two Families in Every Garage."

—KANSAS CITY STAR

The catalogue of shortages is fabulous. Walt Whitman, in his most "barbaric yawp," never envisioned such possibilities in itemization. The country is short of meat, maple syrup, lemons, bread, butter, cheese, milk, barley, ice cream, candy, pie, cake, fruit syrups, onions, bacon, sugar, fats, doughnuts, molasses, coconut oil, olive oil, cottonseed oil. There is a shortage of salesmen, of train seats, of plane seats, of pharmacists, of hotel rooms, of veterinarians, carpenters, piano makers, gardeners, telephone linemen, painters, cooks, and parlor maids.

Nine months after the fourth consecutive biggest wheat crop on record was raised, a cold spring wind was blowing through hundreds of empty grain elevators throughout the Midwest. There are shortages of X-ray tubes, dental gold scrap, bur-lap bags, Pliofilm, manila cordage, bulldozers, quinidine, power cranes, laboratory and medical instruments, fractional-horsepower motors, circular saws, solder, natural resins, road rollers, electrocardiographs, roofing material, greenhouses, plumbing supplies. Paper is short. Artists cannot buy sable-hair paintbrushes. There is a shortage of spare parts and of theatres.

The country is short of lumber, coal, steel, tin, lead, anti-mony, textile piece goods, shellac, glass, lead pipe, paint, copper, mercury scrap, platinum scrap. The country is short of men's suits, children's clothing, film, cameras, lenses, towels, sheets, pillowcases, automobiles, trucks, tractors, tires, bourbon, Scotch, rye, beer, chewing gum, soft drinks, white shirts, pianos, radios, washing machines, refrigerators, work clothing, maple for high heels, shoe tacks, telephones.

The list of shortages is endless, almost; the demand is fantastic; everyone seems to have money, no one seems to go broke—these are the stigmata of Boom.

*"An optimist, in the atomic age,
is a person who thinks the future is uncertain."*

—LINDSAY AND CROUSE (*State of the Union*)

The actual meaning of the panorama must await the historians. All that is possible contemporaneously is to write the chronicle, not the interpretation. To report the present state and future prospects of each business in the U.S. is not adequate, however thoroughly performed; such a massive catalogue would serve to show only one phase of the scene, simply that the prospects for almost all businesses are now excellent, and that the abnormal superimposed demand, cumulatively backed up through the war years, will be exhausted at some time in the future. At what particular time varies from industry to industry, from six months to four or five years—with the single exception of housing, about which the talk runs up to ten years.

But it illuminates the state of the nation in 1946 to know that the department-store sales in March in the U.S. were 263 per cent of the 1936-39 average; that the New York Telephone Co.'s Red Book, classifying business houses, is the largest in history; or even that by 1947 the passenger capacity of the nation's airlines will equal that of the railroads in 1941. Staggering as such facts are, they are only facets of the Boom.

Thus perhaps the best that can be done is to sample the economic scene, taking random soundings, and to name the most obvious things that loom out of the landscape. These obvious things can be reduced, actually, to four broad generalities and a false assumption, all of them as obvious as a sunrise.

The false assumption was that there would be a reconversion depression. For three years economists, viewing the U.S. as one great arsenal that manufactured only war materials, had prepared the people for a great immediate slump when the aircraft plants, the tank factories, the shipyards, shut down. Washington economists made the now-famous prediction of eight million unemployed. The slump was a myth; physical reconversion took place in a few weeks. The full-employment bill, a matter of hot debate all autumn, became law lamely on February 20, as realization came that there was no unemployment worth mentioning. In May, President Truman still had not appointed the three-man council to administer it. And nobody much cared. Meanwhile, what some economists had foreseen came about: an actual labor shortage developed as one of the main new facts of current American economic life.

The four broad generalities are:

1. Everyone was tired. Nearly everyone needed time to straighten out his personal affairs. The important factor was personal reconversion. The patterns of millions of lives were sharply changed in the transition. This was the real reconversion, still incomplete, the change in American living habits. As the soldiers came home, the women quit work, men shifted jobs, people traveled as they had never traveled before. And everyone vacationed or struck or moved or went shopping or off to the race track. This explains Florida and many strikes.

2. The Boom is now everywhere. It is evenly spread throughout the nation. Never were there so few exceptions to a high, almost balanced, level of prosperity. This condition has never before obtained in the U.S. either in good times or in bad. It is true in all ways—all the U.S. is short of beer, all the U.S. has plenty of cash.

3. The black market is the market. The black market is the basic phenomenon of these times of shortages, cash-heavy pockets, and price control. On the items that are most severely short, the black market is becoming the real market in the U.S. today, where most sellers meet most buyers. With the fading of patriotism came a lessening of the sense of guilt about the black market. When everyone sins, who can tell the sinner?

4. Everyone foresees the end. Nearly every American citizen, whether taxi driver or banker, thinks he knows exactly when the Boom is going to end—and thinks he is planning accordingly. Few people have any real faith that prosperity will last much beyond 1950, many think it won't last that long. Indeed, the very odd but very definite unanimity about the Boom's end probably makes it valueless as prognostication.

The foregoing general observations upon the economic and social landscape must be seen in the peculiar fluorescent light of 1946. The conditions of American life today are without precedent. Parallels with 1929 or 1921 or any other period break down quickly. And to be understood they must be viewed in this peculiar light, in the conditions of the past from which they spring.



European

The Anatomy of the Boom

Every boom is different; each arises out of the landscape of the times, and collapses for reasons peculiar to its period. The great 1946-50 boom is not yet real prosperity; thus far it is a massive and feverish activity resulting from an undersupply of goods and an oversupply of money. This chart shows where the money came from and where it is going.

unspent money reduced indebtedness and went into

... and money accumulated

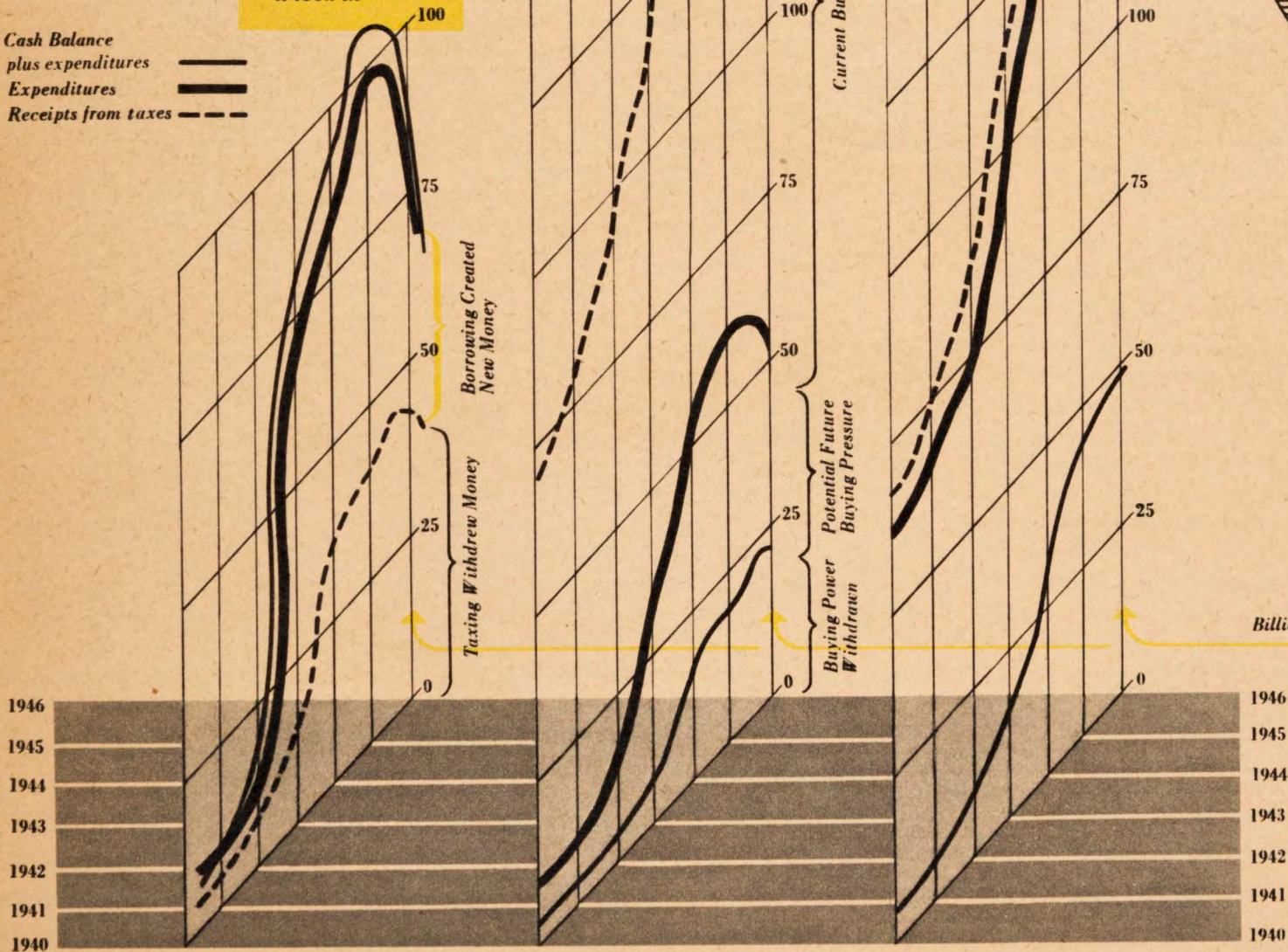
Currency
Bank deposits
Government securities
Cumulative totals

Individuals' incomes expanded

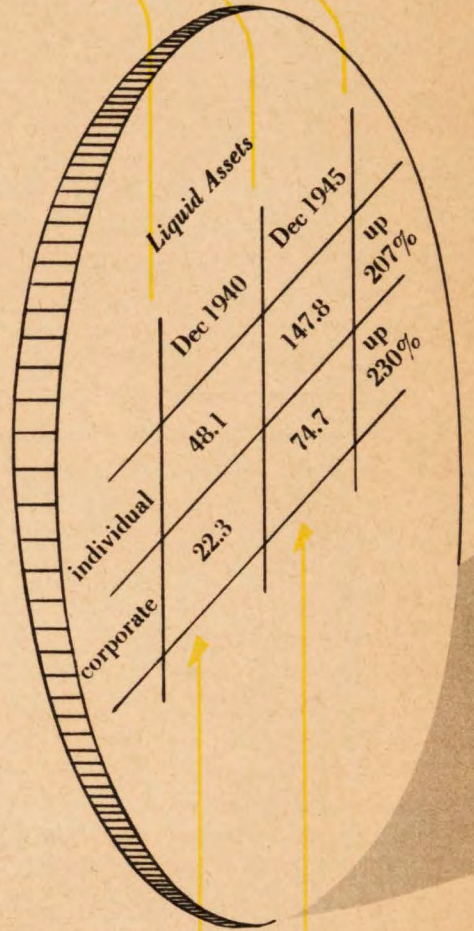
Expenditures
Savings
Taxes
Cumulative totals

To finance war government spent more than it took in

Cash Balance plus expenditures
Expenditures
Receipts from taxes



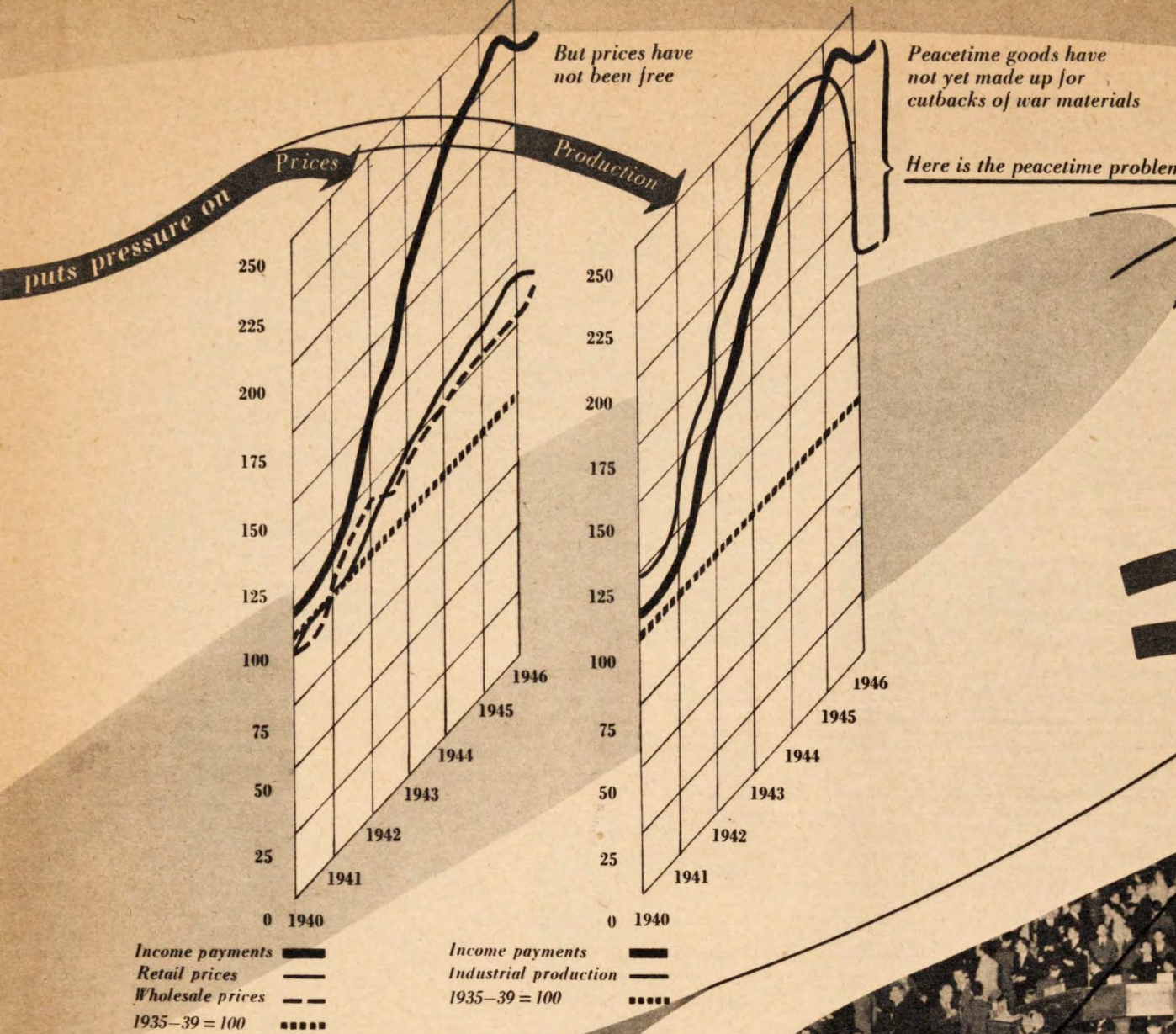
this unspent money.....



Billions of dollars

1946 estimated

1946 estimated



until production catches up

we shall continue to have



Housing Crisis
Over all the U. S., prices for small and medium houses are 100% above 1940. The Kansas City Star cracked: "Slogan for 1946—Two Families in Every Garage!"



Excitable Stock Market
From V-J day to May, industrial stocks went up 27%, railroads 20.7%, utilities 34%. The market is broad but thin; and no one is jumping from windows—yet.



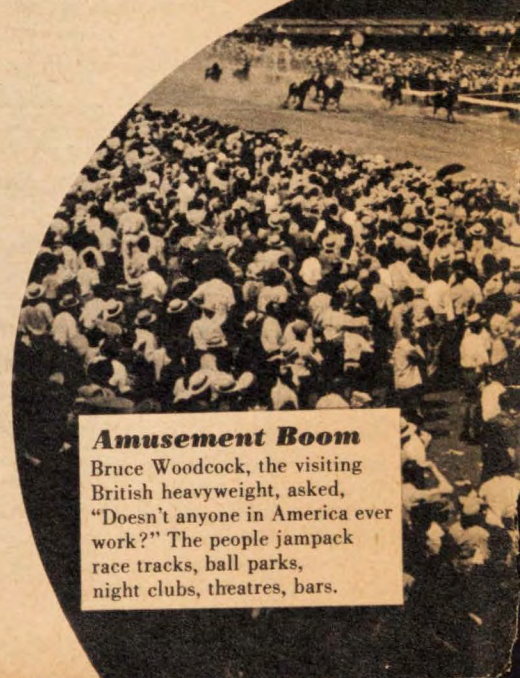
Black Markets
To buy a car, you must buy the salesman's necktie; to buy meat, you must not ask the ceiling price; the black market is the real market.



Shortages
The symbol of 1946 is the "nylon line," but Americans are still short of almost everything, from autos and butter to xylophones and yachts.



Retail Buying Spree
There has never been anything like it. In February retail business was up (vs. 1940 average); jewelry 173%, apparel 154%, food stores 112%, department stores 132%.



Amusement Boom
Bruce Woodcock, the visiting British heavyweight, asked, "Doesn't anyone in America ever work?" The people jampack race tracks, ball parks, night clubs, theatres, bars.



Martha Holmes—Life



Jerry Cooke-Pix

THE PEOPLE LINE UP—FOR FOOD, DRINK, NYLONS, AND LAND; INFLATION APPEARS AS VARIOUS KINDS OF MONSTER



Knott in Dallas Morning News



York in the Louisville Times



Ed Kuekes, Cleveland Plain Dealer



Fitzpatrick in St. Louis Post-Dispatch

In the violet fluorescent light of the 1946 scene, it is hard to say whether the rosy flush of prosperity is the bloom of health or a fatal fever. But after months of inflation there is no real inflation—yet; things cost lots of money, but not a wheelbarrowful of dollars for a loaf of bread. Inflation is a threat,

not a reality; but shortages of almost everything are very real. White shirts are coming back now; so are men's suits, soon; but nylons-for-everybody will take eighteen months, and new-cars-for-everybody will take at least four years. The postwar dream world is still a long way from coming true.



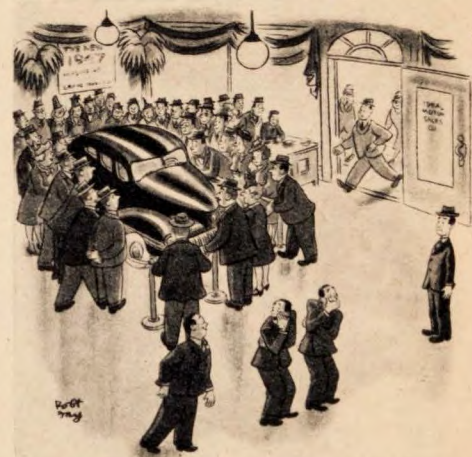
"It is a little far from the city—but not a bit too far if they don't solve the atomic-bomb problem!" Lichty, Chicago Times Synd.



"This model has one big advantage over the others—you can buy it!"



"You mean we all have to hang around here till a 34-short drops in?"



"He wants a demonstration!"

These three cartoons by Robt Day, permission The New Yorker, © The F.-R. Publishing Corp.

and will produce implements for Britain in a Manchester factory employing British labor and using British war materials. Such are the far-reaching effects of British belt tightening.

FURROWS OF EUROPE

James Duncan was the first Canadian businessman to enter France after the liberation. He was well in advance of his nearest follower. Last fall he returned for a second visit to the Continent—where he had been European General Manager from 1927 to 1932. He found the Westhoven plant in Germany leveled. In France he picked up from the *gendarmierie* the last news of an old friend, the European manager from 1938 to 1942, Sigismund S. Voss. Mr. Voss, a Latvian Jew, stuck to his post during the occupation, writing to Mr. Duncan that he felt he ought to stand by. The French police gave Mr. Duncan a handwritten dossier describing how Mr. Voss was removed from his home by the Gestapo in November, 1942. He was presumably taken east to death in the transports.

W. K. Hyslop, President of the U.S. company, was in Europe at the time Mr. Duncan made his second trip. Mr. Hyslop, accompanied by British-born George Thomas, long-time Massey-Harris manager in Germany, made a trip by jeep into the Netherlands. They were especially interested in learning the wartime fate of a distributor in Zutphen from whom they had not heard since before the war. Passing into Zutphen, they found the bridges down and many structures leveled. When they reached their agent's business place, it was still standing. They were delighted to find him alive. His son had been killed by the Gestapo. He himself was ready to begin work. To Mr. Hyslop's amazement, he saw over the dealer's shoulder a row of colorful Massey-Harris tractors he had hardly hoped to find in the Netherlands. They had been delivered to Zutphen by UNRRA. Mr. Thomas was impressed chiefly by the Dutchman's stolid attitude toward reconstruction.

The European market is complex, has always been fairly large. In 1929, for example, U.S. companies sent about \$36

million worth of implements to the Continent. In the same good year, Massey-Harris sales there were about \$7 million. Europe's need now is enormous. Much equipment has been destroyed—and the black market has enriched many rural families. The \$100 to \$150 million imports of farm tools that Europe might be able to absorb usefully in a peak reconstruction year is an annual total that might never be realized. At present many factors are ranged against it. One is the pressure of North American farmers for supplies of equipment from their own companies. Another is the European farmer's lack of credit.

A challenge to farm-tool sales that exists in almost every European country is the present and possible future effect of politics on the texture of the market. Companies like Massey-Harris are likely to feel more and more uncertain about such matters as they move east toward the Russian border. One of its fears recalls the days when U.S. mail-order houses snatched a vulnerable sector of farm-implement profits by price-cutting moves into the high-margin parts business. Massey-Harris wants to sell machines in countries like Czechoslovakia. Normally, such sales should roll up a traditional extra profit in future years by the demand they create for replacement parts. Massey-Harris, however, feels that in eastern Europe it may someday be faced with Russian competition for the parts business. Perhaps so. But it hardly seems possible that even five years from now the Russians will be able to turn from their own industrial-reconversion burden to supply eastern Europe with cut-price tires, piston rings,

[Continued on page 246]



SOMETHING NEW IN TORONTO is the long assembly line for combines being completed in the King Street plant. Farm-tool assembly lines seldom rival those of the auto industry. On most implements volume is simply not big enough to justify heavy overhead in assembly-line equipment. The layout in this picture, nevertheless, suggests a quickened tempo for Massey-Harris.



THE GREAT SCIENCE DEBATE

*The atom touched off more
than a battle on atomic energy.*

*It lighted up a greater debate on a national science policy
and on the furtherance of fundamental science in our society.*

The figures fall a little flatly on the page. About \$10 billion of U.S. funds for scientific research and development in four years of war. About \$500 million spent by the Office of Scientific Research and Development (OSRD) in mobilizing the basic sciences and scientists. Some 15,000 scientists—aerodynamicists to zoologists—engaged in some 2,500 research contracts with nearly 500 institutions. The grand total itself, with research costs all mixed up in government contracts and the services, is only an estimate. But \$10 billion may serve to symbolize the most intensive and extensive use of science by government in any equal period of history. A record of OSRD's activities is now in the process of filling eighty to ninety fat official volumes, which may well take a decade of peacetime industry to digest. And shining malevolently in OSRD's crown is atomic power, that great new force for good or evil.

It is possible now to stand off a little and appraise this greatest of all experimental agencies and the men who made it go. It is also possible to see some distance into the future. For almost as soon as OSRD began to function in 1941, plans for extending some such agency into peace began to be argued. A composite bill is now before Congress—may even be passed upon as this appears—that would set forth an entirely new U.S. science policy. A start must be made in weighing our successes and failures, in seeing ourselves clearly. The future welfare and security of the nation may well depend on it.

This much may be put down as basic. OSRD revealed some grave deficiencies not only in military and industrial research but also in the basic scientific research of the country. Fortunately, with time, lavish funds, and heroic energy none proved fatal. Secondly, none of the wartime achievements were in the nature of pure research, blazing new trails to basically new principles; all were simply applied research from prewar funds of knowledge, much of it from abroad. This distinction is important. The U.S. achievement is chiefly in development and engineering, always monumental and often brilliant, but uncomfortably recalling the Roman Empire. Far from filling in the deficiencies of basic research, the war has actually worsened them. Within this framework there was a third basic fact to come out of the war. This was that, given the will, talent, and funds, there is almost no physical problem within bounds that will not yield to applied science. The tools are at hand or can be invented. The only major problem is to decide what is best to be done.

The problem, therefore, is a redefinition of the role of science in society. This is now being hammered out in a debate reminiscent of the great debates of the nineteenth century. True science has little to do with war. The problem is how to break the periodic and death-dealing subversion of science to war,

how to shape this superb instrument, built up out of three revolutionary centuries, to the conscious ends of peace.

THE GUERRILLA FORCE OF SCIENCE

In 1836 the U.S. made its first research grant to the Franklin Institute of Philadelphia to investigate the steam engine, another new power, which, in the chronicles of the day, was viewed as a vehicle for good or evil. Each successive war gave the U.S. an additional push into scientific research and a new agency to promote it. In the Civil War it was the National Academy of Sciences; in World War I, the National Research Council; and in this last war it was OSRD, created to do what its predecessors could not do, initiate and develop on a gigantic scale the new instrumentalities of conflict. OSRD alone developed over two hundred new weapons and devices of war, along with dozens of advances in medicine, metallurgy, meteorology, biochemistry, bacteriology, applied psychology, and a dozen other fields.

In the wicked U-boat warfare of 1942-43, the scientists were called on in a hurry to develop countermeasures. They equipped sea patrol planes with radar to detect surfacing periscopes and subs, day or night, over wide areas. They invented a device called M.A.D. (for Magnetic Airborne Detector) to detect large bodies of iron or steel below water, where radar could not penetrate. To bring the patrol down on its target fast, in fog or darkness, they installed absolute altimeters capable of pulling the aircraft out of its dive at any predetermined level. For the kill, they loaded up the best rockets from OSRD's extensive rocket development. Then, to make sure the devices were properly used and accepted by skeptical military men—a problem with all new weapons—they put in hidden wire recorders to transcribe crew conversation for later study. In a few tough cases a scientist rode along in the Plexiglas nose to show that he would risk his neck on the equipment. These, plus many other devices and constantly improving military tactics, soon knocked the bottom out of German subsurface warfare.

Military inertia was always a delicate problem. OSRD had rockets—one of its best developments on the level of small projectiles and new propellants—before the military was ready to accept them. When the Germans, following the Russians, began flinging rockets, the military came around on the run. At California Institute of Technology, where the big Division on Rockets headed up, not only did the professors do all the developmental work, but, when the Navy clamored for production, they turned for a time to putting out the goods in quantity.

Often OSRD was the harassed middleman. When an early communications committee first sat down, both the military and industry said equipment was ready for anything. "Buyer and

The strange mountain rising from the plain in this month's FORTUNE cover is not the creation of an artist but the abstract creation of a great American scientist that lends itself to the symbolism of contemporary art forms. It is a historic plaster model of Willard Gibbs's first graphic thermodynamic surface—a statue of water in all its phases. Gibbs stands as one of the lonely mountain peaks in U.S. basic science—a shy professor of mathematical physics at Yale, who died almost without popular recognition in 1903. Excited by the beauty of Gibbs's concept, the great



Clerk Maxwell made three plaster models from his bare notations, sending one to Gibbs. Men are still quarrying Gibbs's mathematical system correlating all forms of energy, now basic to all physical chemistry and most modern industry. Its great key is the Phase Rule, noted on a scrap of paper on the cover. Behind the mountain is another model of a chemical system. In the sky is the face of a radar scope, and an oscillograph analysis of an electrical current. Below is Newton's apple, dropping with all the immutable gravity and complexity of natural law.

seller were happy" is the way an OSRD official ruefully describes it. The division was quiescent until the battles really started and moved out in the Pacific. Then field reports began to raise hell. OSRD had to set up a whole new Committee on Tropical Deterioration to study fungi and mold growths to help redesign equipment. It had to set up a Committee on Propagation when radar in the Bay of Bengal suddenly reached ranges almost 1,000 miles beyond its supposed limits, and do meteorological research in radio-microwave transmission that the industry had never managed to do. That's how OSRD was drawn into things.

Small or large teams of scientists attacked problems. A small group in the U.S. Department of Agriculture's Peoria laboratory laid down all of the development work on penicillin molds, strains, and cultures leading to production; a single clinician with a driving curiosity pushed the use of penicillin into an efficacious treatment of syphilis. A big group of chemists and industrial laboratories turned some 15,000 compounds inside out to find a specific against malaria—a quest that has now uncovered some potentially powerful new drugs. The range of medical research can hardly be suggested, except that it was the spearhead in bringing the Army's death rate from disease alone down from 14.1 per thousand in the last war to 0.6 in this.

A small group in the Department of Terrestrial Magnetism, Carnegie Institution of Washington, worked out the famous VT proximity fuze, one of the deadliest factors in U.S. mass artillery and anti-aircraft fire. Essentially a radio device, with thimble-sized tubes and, in some varieties, a complete circuit baked in metal paint on a ceramic disk no bigger than a milk-bottle top, the VT fuze is about to detonate in the radio industry. At the same time the same group worked out a great range of countermeasures. Meanwhile the Division on Subsurface Warfare, not knowing a VT fuze existed but searching for countermeasures to enemy radio-guided bombs, created a "popper" to predetonate them before they reached their targets. In a show-down test before skeptical officials, a small piece of apparatus automatically found and blanketed the wave lengths and popped some 50 per cent of the VT-fuzed missiles tossed at it.

At the other end of the scale, there were, of course, the radar and atomic-bomb projects, which started with comparatively small teams of top scientists, finally drew in nearly half of all scientists employed through OSRD, and engendered huge laboratories of their own to make up the deficiencies of private research and corporate engineering. They were not alone in this. The Chemistry Division finally sprawled over five huge, centralized research laboratories at the University of Illinois, Chicago, Northwestern, Carnegie Institute of Technology, and George Washington University. The day of the lone "attic in-

ventor," if it had ever really existed, was definitely over. In the later stages of these projects, where U.S. industrial power was decisive, there were welded together the mightiest teams of science and industry in all history. "A third army," is the way Thomas Huxley described the scientists in 1880, "ranged round the banners of physical science . . . somewhat of a guerrilla force, composed largely of irregulars."

THE MAD WHIRL OF RADIAL RESEARCH

The main technique that OSRD hit upon, through force of circumstances and lack of time, was "radial" research. Instead of the normal step-by-step procedures of peace, advancing as up a straight stairway, OSRD started from a problem, searched for the right men to tackle it, and flung out research teams in all directions at once. This accounted for high costs and some waste, but developed great speed and an enormous variety of results.

Well along in its career OSRD also adopted the British system of close interplay between research teams and the battle fronts. OSRD not only had to invent new weapons but often had to teach the services how to use them. When "ducks" and other amphibious vehicles, in the developing of which it had had a large part, were hung up on coral reefs or smashed in surf because the Army had put plain truck drivers to operating them, OSRD persuaded the Army to call in the Coast Guard, which knows about surf, and train special drivers. To close such gaps and provide itself with quick field experience, OSRD launched its operations analysts—teams of technicians working on six-month shifts at the fronts and then in the laboratories. Such teams were offered to theatre commanders to accept or reject, observing all the niceties of military protocol; but if accepted, they were to have direct access to commanders. Teams brought in the latest devices for trial, checked over recent equipment, showed GI's how to operate the new stuff, and collected criticism hot from combat.

OSRD's Office of Field Service worked with varying success from theatre to theatre, depending upon the commander's kidney. Many practical military men at the start resented any "interference" from civilian scientists, called "longhairs." As OSRD's accomplishments became undeniable, its teams worked cooperatively in more and more theatres. The most alert branch was the Army Air Forces, which drafted its own teams even before OSRD got around to it. And the Navy and other branches developed good technical liaison. The longest holdout was that of General Douglas MacArthur, who refused to allow OSRD into his theatre until the summer of 1945. Then, with the atom bomb just around the corner, OSRD put together a stellar team headed by Dr. Karl T. Compton—a group "you couldn't buy for a

The High Command



BUSH



CONANT



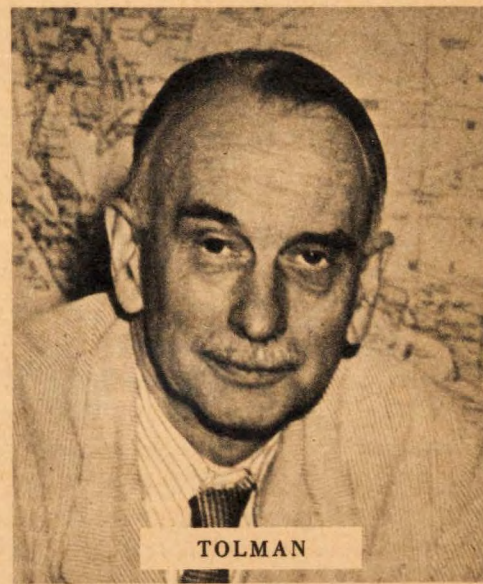
COMPTON



JEWETT



RICHARDS



TOLMAN



BOWMAN

VANNEVAR BUSH, fifty-six, is the grandson of a New England whaling captain and tireless director of OSRD. Teacher and administrator from Massachusetts Institute of Technology, and now President of Carnegie Institution, he supports a new peacetime agency. "Unless federal funds are brought to bear . . . there will be certain fields of basic research which will fail to receive due attention."

JAMES BRYANT CONANT, fifty-three, six-foot President of Harvard University, was almost coequal with Bush in the direction of OSRD. He coordinated British-American research. Cool, conservative, he irritated his students by being among the first to plump for active war, enraged the scientific rank and file in 1946 by supporting the May bill for military control of atomic energy.

KARL T. COMPTON, fifty-eight, is third of the triumvirate of Bush, Conant, and Compton, in on the formation of NDRC, active in organizing the big M.I.T. Radiation Laboratory in radar, and later head of OSRD's Office of Field Service—all the while carrying on as President of M.I.T.

FRANK B. JEWETT, sixty-six, long the honored head of Bell Telephone Laboratories, now retired, is President of the National Academy of Sciences. He was high in OSRD councils. His is the sole voice against a new agency. "Funds spent," he says, "may easily do more harm than good."

ALFRED N. RICHARDS, seventy, Vice President of the University of Pennsylvania, is head of the Committee on Medical Research. He is for a new agency, but warns: "The conception that a \$2-billion Manhattan District project aimed at . . . cancer will have early success seems to me to be fallacious."

RICHARD C. TOLMAN, sixty-five, Dean of the Graduate School, California Institute of Technology, is a noted physical chemist, headed NDRC's early division on armor and ordnance. He drew in the West Coast.

ISAIAH BOWMAN, sixty-seven, is an erudite political geographer and President of Johns Hopkins University, close adviser to Dr. Bush. He formed a committee to support the Bush proposal. Says he: "One of the roots of the tree of peace is science."

million dollars"—which went into the Pacific with the rank of an army or fleet command. It arrived a few days before Hiroshima.

OSRD wound up with nineteen separate operating divisions, many special panels and committees, plus its Committee on Medical Research, plus two supersecret divisions kept entirely apart—Section S-1 (atomic energy) and Section T (VT fuzes), which were handed over respectively to the Army and Navy in 1943 and 1945. The sparks that flew from these broad operations cannot be contained in a small space.*

One group made time-study analyses on heavy artillery that brought the Army's fire rate up to the more efficient Navy's. Another designed the "weasel" and subzero equipment for a Norwegian campaign that never came off—equipment now being used in Operation Musk-Ox across the barren top of North America. Another discovered a new and remarkable steel-hardening ingredient in a familiar grocery staple—borax. OSRD projects led to the isolation of eight new chemical elements, and produced such an arsenal of top-secret horrors out of researches in molds and bacteriological warfare that they are referred to in whispers. Another project cooked up a "flour" for OSS saboteurs that mixed with water to form a handy explosive; and another project worked out the infrared "sniperscope" and much else, still under wraps, on these invisible rays for seeing in the dark. The Division on Physics developed a forty-inch-focal-length aerial camera lens able to separate railroad ties at 30,000 feet. And the Division on Fire Control worked out with industry a whole range of servo-mechanisms for automatic gun laying—amazing devices that translate signals from radar and other electronic controls into mechanical action, and open a possible development of automatically fed, controlled, and operated machines for industry that may be staggering in its implications. And there remains atomic power, which, within a generation, is destined to work a greater revolution than steam.

Such were the physical achievements of OSRD. Its activities were cut back to about 15 per cent shortly after the war,

and officially, save for the winding-up process, will be ended this month. Most of the great scientific teams, including the key group on atomic energy, have long ago disintegrated. Though all of the achievements were applied research merely, there is no doubt that the "longhairs" shortened the war by many months, and, with more real military cooperation from the start, might have shortened it by much more.

THE MEN WHO MADE IT GO

The man empowered to put the whole intricate mechanism of OSRD together was Dr. Vannevar Bush. Dr. Bush first moved to Washington in 1939 to head the Carnegie Institution—a lean, rustic-looking Yankee, engineer, and mathematician, who for nearly two decades had been a professor, dean of engineering, then Vice President of Massachusetts Institute of Technology. To scientific circles he was chiefly known for the invention of the Bush Differential Analyzer—a huge "mechanical brain" that solves complex mathematical equations in short order†—and for a Yankee political knack of getting ahead in the academic world. Yet, on the whole, few of F.D.R.'s war administrators proved so peculiarly fitted for their special tasks or performed so smooth a job.

The first requisite of an administrator was the confidence of the scientific fraternity. Vannevar Bush had the correct background, and from the beginning of the National Defense Research Committee in 1940 (later absorbed into OSRD) he had the correct associates. NDRC started with four major divisions,

*A popular one-volume official history of OSRD, entitled *Scientists Against Time*, by Dr. James P. Baxter 3rd, will be issued in early fall by Atlantic Monthly Press—Little, Brown Co.

†Now outdistanced by an Army Ordnance—University of Pennsylvania development, ENIAC (for *Electronic Numerical Integrator and Computer*), a mammoth electronic "brain," developed for ballistic and aerodynamic computations in this war, and able to solve the toughest problems with greater accuracy and about one hundred times faster than the Bush machine.

J. ROBERT OPPENHEIMER, forty-two, University of California, headed the atomic plant at Los Alamos, was an architect of the State Department's international report on atomic energy. "We put technical intelligence on the side of making peace rather than war."

LEE A. DUBRIDGE, forty, came out of the University of Rochester to run M.I.T.'s Radiation Laboratory. Strong for science's freedom, he says: "The laws of science know no political boundaries . . . If science is international, it must be really international."

FREDERICK L. HOVDE, thirty-eight, new President of Purdue University, came out of football stardom at Minnesota and a post as assistant to the President of the University of Rochester to head NDRC's London office, later head the powerful Rocket Ordnance Division at Cal. Tech.

The Young Command



OPPENHEIMER

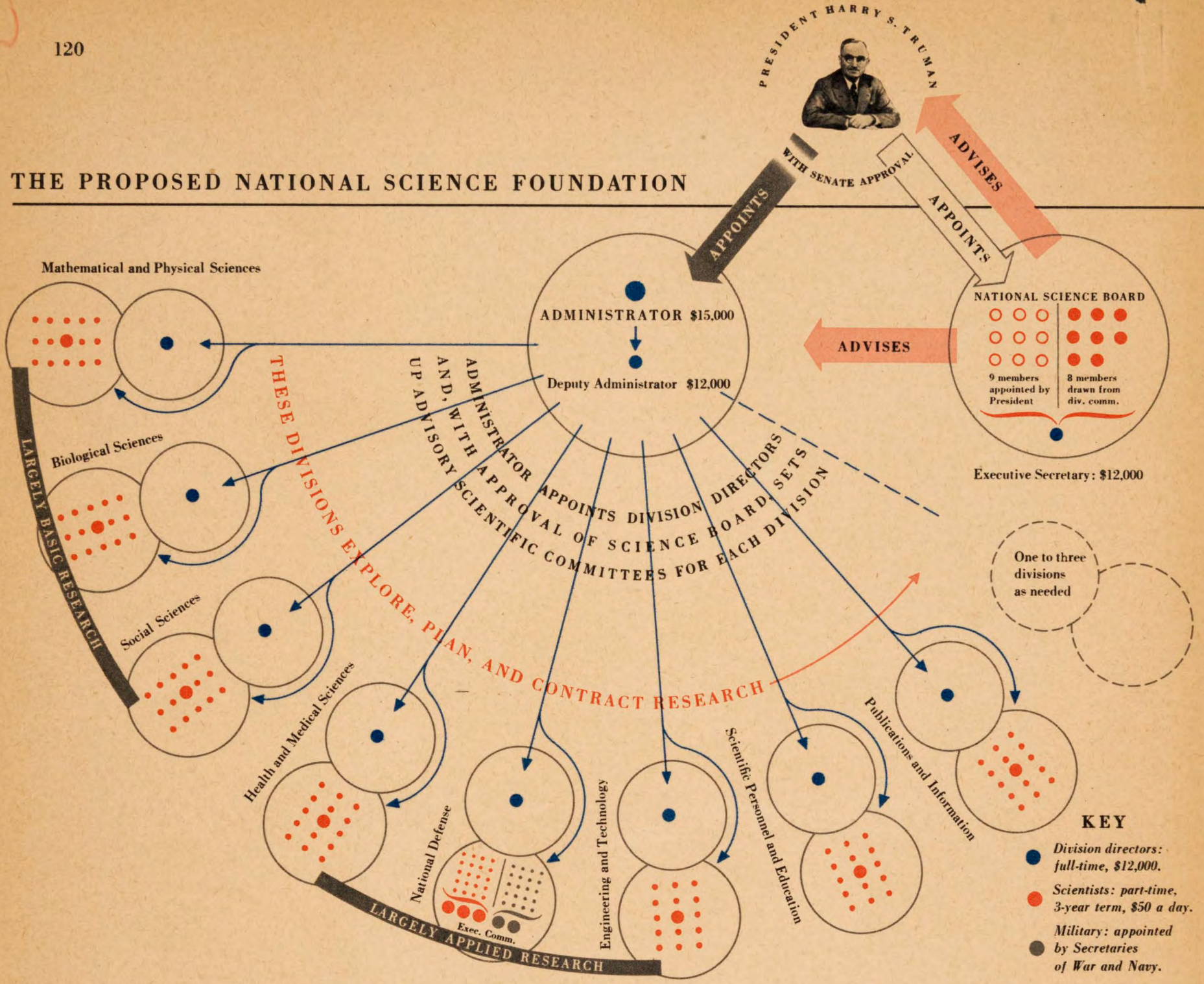


DUBRIDGE



HOVDE

THE PROPOSED NATIONAL SCIENCE FOUNDATION



headed by Dr. James B. Conant, President of Harvard; Dr. Karl T. Compton, President of M.I.T.; Dr. Richard C. Tolman, Dean of the Graduate School of California Institute of Technology; and Dr. Frank B. Jewett, President of the National Academy of Sciences, member of the M.I.T. Corporation, and, until 1944, head of Bell Telephone Laboratories. (Dr. A. N. Richards of the University of Pennsylvania later joined the high command as head of the more or less autonomous Committee on Medical Research.) This potent group was a prime mover in the formation of NSRF and carried over into the wider sphere of OSRD. Indeed, the administration of OSRD resolved itself into the triumvirate of Bush, Conant, and Compton.

A second administrative requirement, hardly subsidiary to the first, was to win and keep the confidence of the military, who for many months were reluctant to trust civilians with top-secret problems. This delicate assignment was perhaps Dr.

Bush's main achievement. He used all of his Yankee guile to throw a cloak of mystery around OSRD, chill all publicity, accede to all military security regulations, and take no credit for OSRD developments so as not to arouse military jealousies. And while going to bed with the military on the one hand, on the other he had to fight them off at every crisis to prevent the wholesale drafting of young scientists, who were his key men in radar, atomic energy, and most of the new technologies. To civilians all of this may seem fantastic, but it was very real and required careful handling.

Bush held vast powers but interpreted them narrowly—refusing, for instance, to get into research on raw materials lest he encroach on WPB and the big producers, or into aviation research lest he step on many toes. Often his decisions were snap and arbitrary, but, working always against time, he held to an iron line. He was the only war administrator who could

[Continued on page 236]

Scrap Book

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